Maryland

The University of Maryland College Park

Undergraduate Catalog 1986-1987

Special Notice

All course offerings and other curricular information contained in this catalog were updated in February, 1986 for the 1986-87 school year. However, on July 1, 1986 the College Park Campus will undergo an academic reorganization. This reorganization is not reflected in this catalog since the publication schedule of the Undergraduate Catalog required all revisions to be completed before a final decision on academic reorganization was made by the Board of Regents.

Under the new plan, the five academic divisions will be replaced by schools and colleges, but departmental requirements and course offerings will not change. Students with questions about the implications of the change in academic structure for particular majors or programs of study should contact the appropriate dean or department head.

Maryland

The University of Maryland College Park

Undergraduate Catalog 1986-1987

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1 General Information

Campus and University Officers

College Park Campus Administration

Chancellor
John B Slaughter
Vice Chancellor for Academic Affairs
William E Kirwan
Vice Chancellor for Administrative Affairs
Charles F Sturtz
Vice Chancellor for Institutional Advancement
A H Edwards
Vice Chancellor for Student Affairs
William L. Thomas, Jr.

Central Administration of the University

President
John S Toll
Executive Vice President
Albert H. Bowker
Vice President for Academic Affairs
Rita R. Colwell
Vice President for Agricultural Affairs
Raymond J Miller
Vice President for General Administration
Donald L. Myers
Vice President for Governmental Relations
Patricia S Florestano
Vice President for Graduate Studies and Research
David S Sparks
Vice President for Policy and Planning
Leroy Keith
Vice President for University Relations
Robert G. Smith

Board of Regents, 1985–1986

Chairman
Mr Allen L Schwait (term expires 1989)
Vice Chairman
Mr Ralph W Frey (term expires 1986)
Secretary
Mr A Paul Moss (term expires 1988)
Treasurer
Mrs Constance C Stuart (term expires 1990)
Assistant Secretary
Mrs Betty R Coss (term expires 1988)
Assistant Treasurer
Ms Claudia Ordonez (term expires 1986)
Members
The Hon Wayne A Cawley, Jr (ex officio)
Dr Joel A Carrington (term expires 1987)
Mr A James Clark (term expires 1986)
Mr Frank A Gunther, Jr (term expires 1987)
Mr George V McGowan (term expires 1989)
Mr Albert W Turner (term expires 1990)
Mr J. Benjamin Unkle, Jr (term expires 1986)
Mr. John W. T Webb (term expires 1990)

1986–87 Academic Calendar

Summer Session, 1986

Session I

June 2	Monday	First Day of Classes
July 4	Friday	Independence Day
July 11	Friday	Last Day of Classes

Session II

July 14	Monday	First Day of Classes
August 22	Friday	Last Day of Classes

Fall Semester, 1986

August 28–29	Thursday–Friday	Registration
September 1	Monday	Labor Day Holiday
September 2	Tuesday	First Day of Classes
Nov 27–30	Thursday–Sunday	Thanksgiving Recess
December 12	Friday	Last Day of Classes
December 13	Saturday	Exam Study Day
December 15–22	Monday–Monday	Final Examinations
December 23	Tuesday	Commencement
December 25	Thursday	Christmas Holiday
Dec. 26–Jan. 1	Friday–Thursday	Mid-year Recess

Spring Semester, 1987

January 15	Thursday	M. L. King Birthday
January 22–23	Thursday–Friday	Registration
January 26	Monday	First Day of Classes
March 16–22	Monday–Sunday	Spring Recess
May 14	Thursday	Last Day of Classes
May 15	Friday	Exam Study Day
May 16–23	Saturday–Saturday	Final Examinations
May 25	Monday	Memorial Day Holiday
May 26	Tuesday	Commencement

Undergraduate Majors and Programs of Study

Division of Agricultural and Life Sciences

Agricultural and Extension Education
Agricultural and Resource Economics
Agricultural Chemistry
Agricultural Engineering
Agriculture—General
Agriculture/Veterinary Medicine
Agronomy—Crop Science
Agronomy—Soil Science
Agronomy—Turf and Urban
Agronomy—Conservation of Soil, Water, and Environment
Animal Sciences
Applied Agriculture
Biochemistry
Food Science
General Biological Sciences
Horticulture
Natural Resources Management
Botany
Chemistry
Entomology
Geology
Microbiology
Zoology

Division of Arts and Humanities

Architecture
Architecture—Urban Studies
Journalism
American Studies
Art History
Art Studio
Classical Languages and Literatures
Dance
East Asian Languages and Literatures
English
French Language and Literature
Germanic Language and Literature
History
Italian (courses only)
Jewish Studies
Linguistics
Music
Music Composition
Music Performance
Music Theory
Philosophy
Portuguese (courses only)
Radio, Television, and Film
Romance Languages
Russian Area Studies
Russian Language and Literature
Slavic Languages and Literatures
Spanish Language and Literature
Speech Communication
Theatre
Women's Studies

Division of Behavioral and Social Sciences

Accounting
Business/Law
Business Management—General
Finance
Management Science and Statistics
Marketing
Personnel and Labor Relations
Production Management
Transportation
Afro-American Studies
Anthropology
Criminal Justice
Criminology
Economics
Geography
Government and Politics
Hearing and Speech Sciences
Psychology
Sociology
Urban Studies

Division of Human and Community Resources

Counseling and Personnel Services (courses only)
Curriculum and Instruction
Education Policy, Planning and Administration (courses only)
Industrial, Technological and Occupational Education
Industrial Technology
Measurement, Statistics, and Evaluation in Education (courses only)
Special Education
Advertising Design
Apparel Design
Community Nutrition
Community Studies
Consumer Economics
Dietetics
Experiential Foods
Family Studies
Housing
Institution Administration
Interior Design
Management and Consumer Studies
Nutrition Research
Textile Marketing/Fashion Merchandising
Textiles
Health Education
Kinesiological Sciences
Physical Education
Recreation

Division of Mathematical and Physical Sciences and Engineering

Astronomy
Computer Science
Mathematics
Physics
Physical Sciences
Statistics
Aerospace Engineering
Agricultural Engineering
Chemical Engineering
Civil Engineering
Electrical Engineering
Engineering—Undesignated
Engineering Materials
Nuclear Engineering
Fire Protection Engineering
Mechanical Engineering

Office of the Dean for Undergraduate Studies

Arts/Dentistry
Arts/Law
Arts/Medicine
General Honors
General Studies
Individual Studies

Preprofessional Options

Pre-Dental Hygiene
Pre-Dentistry
Pre-Forestry
Pre-Law
Pre-Medical Technology
Pre-Medicine
Pre-Nursing
Pre-Optometry
Pre-Osteopathic Medicine
Pre-Pharmacy
Pre-Physical Therapy
Pre-Podiatric Medicine
Pre-Veterinary Medicine

Certificate Programs

Afro-American Studies
Applied Social Science
East Asian Studies
Liberal Arts in Business
Women's Studies

Note: Course code prefixes may be found with individual program descriptions in Part 3 of this catalog.

University Policy Statement

The provisions of this publication are not to be regarded as an irrevocable contract between the student and The University of Maryland. Changes are effected from time to time in the general regulations and in the academic requirements. There are established procedures for making changes, procedures which protect the institution's integrity and the individual student's interest and welfare. A curriculum or graduation requirement, when altered, is not made retroactive unless the alteration is to the student's advantage and can be accommodated within the span of years normally required for graduation. When the actions of a student are judged by competent authority, using established procedure, to be detrimental to the interests of the University community, that person may be required to withdraw from the University.

Important Information on Fees and Expenses

All Students Who Pre-Register Incur a Financial Obligation to the University. Those students who pre-register and subsequently decide not to attend must notify the Registrations Office, Room 1130A, North Administration Building, in writing, prior to the first day of classes. If this office has not received a request for cancellation by 4:30 p.m. of the last day before classes begin, the University will assume the student plans to attend and accepts his or her financial obligation.

After classes begin, students who wish to terminate their registration must follow the withdrawal procedures and are liable for charges applicable at the time of withdrawal.

Disclosure of Information. In accordance with "The Family Educational Rights and Privacy Act of 1974" (P.L. 93-380), popularly referred to as the "Buckley Amendment," disclosure of student information, including financial and academic, is restricted. Release to anyone other than the student requires a written waiver from the student. (For complete University Policy on access to and release of student data/information, see page 18.)

State of Maryland legislation has established a State Central Collections Unit and in accordance with State law the University is required to turn over all delinquent accounts to them for collection and legal follow-up. These are automatically done on a monthly basis by computer read-out.

Collection Costs. Collection costs incurred in collecting delinquent accounts will be charged to the student. The minimum collection fee is 15%, plus any attorney and/or court costs.

Policies on Nondiscrimination

Legal Requirements

The University of Maryland is an equal opportunity institution with respect to both education and employment. The University's programs and policies are consistent with pertinent federal and state laws and regulations on nondiscrimination regarding race, color, religion, age, national origin, sex, and handicap. Inquiries concerning this policy should be directed to the Office of Human Relations Programs, 1107 Hornbake Library, The University of Maryland, College Park, MD 20742.

Human Relations Code

Under its Human Relations Code, adopted in 1976, The University of Maryland College Park affirms its commitments to a policy of eliminating discrimination on the basis of race, color, creed, sex, marital status, personal appearance, age, national origin, political affiliation, or on the basis of the exercise of rights secured by the First Amendment of the United States Constitution. Inquiries concerning the provisions of the Code should be directed to the Office of Human Relations Programs, 1107 Hornbake Library, The University of Maryland, College Park, MD 20742.

Title IX Compliance Statement

The University of Maryland College Park does not discriminate on the basis of sex in its educational programs and activities. The policy of nondiscrimination extends to employment in the institution and academic admission to the institution. Such discrimination is prohibited by Title IX of the Education Amendments of 1972 (20 U.S.C. 1681, et seq.) and 45 C.F.R. 86, and this notification is required under the Federal regulations pursuant to 20 U.S.C. 1681, et seq.

Inquiries concerning the application of Title IX and Part 86 of 45 C.F.R. to The University of Maryland College Park may be directed to the Office of Human Relations Programs, 1107 Hornbake Library, The University of Maryland, College Park 20742, or to the Director of the Office of Civil Rights of the Department of Education, Washington, D.C.

Section 504 Compliance Statement

The University of Maryland College Park does not discriminate on the basis of handicap in admission or access to its educational programs and activities. This policy of nondiscrimination extends to employment in the institution. Such discrimination is prohibited by Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 706) and 45 C.F.R. 84, and this notification is required pursuant to 45 C.F.R. 84.8.

Inquiries concerning the application of Section 504 and part 84 of C.F.R. to The University of Maryland College Park may be directed to the Campus Coordinator on the Handicapped, Main Administration Building, The University of Maryland, College Park, MD 20742.

Gender Reference

The masculine gender whenever used in this document is intended to include the feminine gender as well.

Academic Information

Undergraduate

Mini-catalog

College Park publishes a free mini-catalog and application packet for prospective undergraduate students. For a copy of this booklet, call 301/454-5550 or write to Office of Undergraduate Admissions, North Administration Bldg., The University of Maryland, College Park, Maryland 20742.

Departmental Brochures

Small brochures of many of the departments at College Park are available free. Write to the Office of Undergraduate Admissions, The University of Maryland, College Park, MD 20742.

Undergraduate Catalog

The Undergraduate Catalog is available free to all undergraduates and to all faculty at College Park before each academic year. Copies are available in libraries and in high schools in Maryland, D.C. and Virginia. Copies are for sale for $2.50 each. Send a check (payable to the University Book Center) to the University Book Center, The University of Maryland, College Park, MD 20742. Write "Catalog" on the check. Allow four weeks for delivery.

Graduate Catalog
Graduate Bulletin

For information about the Graduate Catalog or the Graduate Bulletin, call 301/454-4006 or write the Graduate Offices, The University of Maryland, South Administration Building, College Park, MD 20742.

Summer Sessions Catalog

For information call 454-3347 or write to the Summer Programs Office, The University of Maryland, Reckord Armory, College Park, MD 20742.

The College Park Campus

Goals

Our objectives are simply stated: to enrich our students, to encourage them to develop the harmonious ideals and fine relationships that characterize cultured individuals; to provide an atmosphere for self-enlightenment and community service, and to promote beneficial research for the welfare of the State, of the Nation and of the community of knowledge everywhere.

Universities in General

The contemporary university is a comprehensive educational institution offering many undergraduate programs.

Universities as we know them in the United States have existed for less than a century, but their roots can be traced back to medieval history. The English college system served as a model for earliest American efforts at higher education. Aspects of the ancient German university tradition were adapted and combined with the English model in the 1870s to form basic outlines of our present institutions. Practical studies were grafted onto these more classically and theoretically oriented traditions by the agricultural emphasis of the land grant movement.

With the explosion of scientific and technological knowledge in the early twentieth century, the role of the university in American society attained increased importance, and today almost all aspects of national life—social, economic, scientific, and cultural—benefit from its educational, research and service functions.

The Campus and The University of Maryland

The University of Maryland College Park was chartered in 1856 as the Maryland Agricultural College under a provision secured by a group of Maryland planters. After a disastrous fire in 1912, the State acquired control of the college and bore the cost of rebuilding. The present form of The University of Maryland dates from the 1920 act of the Maryland state legislature, which united the State-owned institution at College Park and the professional schools in Baltimore, creating The University of Maryland College Park (UMCP) and The University of Maryland at Baltimore (UMAB) campuses. Later, the University added three other campuses: Baltimore County (UMBC) at Catonsville, Eastern Shore (UMES) at Princess Anne, and the worldwide University College (UMUC), headquartered at College Park.

Libraries

The Theodore R. McKeldin Library is the main library of the UMCP library system, containing reference works, periodicals, circulating books, special collections and other materials to support research and instruction. Branch libraries include the Hornbake (Undergraduate) Library, the Engineering and Physical Sciences Library, the Architecture Library, the White (Chemistry) Library, the Art Library, and the Music Library.

The libraries on the College Park Campus include over 1.6 million volumes, approximately 2.3 million microfilm units, and approximately 19,800 current periodicals and newspapers as well as 566,000 government documents, 91,000 maps, 36,000 phonorecords, films and filmstrips, slides, prints, and music scores.

The Hornbake Library, opened in 1973, seats 3,600 students and has a book capacity of 200,000 volumes. The Nonprint Media Services Department on the fourth floor features color video tape players and playback units, enclosed rooms equipped with instructor's consoles for the use of nonprint media materials, and wireless headsets for tapes of lectures, plays, speeches, and music. In addition, the building houses reference services aimed for undergraduates, circulation and reserve services, a study room open 24 hours a day, and the Music Library on the third floor (which contains such special collections as the Wallenstein Collection of musical scores, research collections of the American Bandmasters Association, the Music Educators National Conference, the National Association of College Wind and Percussion Instructors, and the International Piano Archives at Maryland). The McKeldin Library supports the graduate and research programs of the University, and is also open to undergraduates. Special collections include the Katherine Anne Porter Collection, the East Asia Collection containing the Gordon W. Prange Collection of Japanese language materials from the period of the Allied Occupation of Japan, 1945-49, and Maryland related books and manuscripts. The libraries also contain U.S. government publications, publications of the United Nations, the League of Nations, and other international organizations, agricultural experiment station and extension service publications, maps from the U.S. Army Map Service and U.S. Geological Survey, files on the Industrial Union of Marine and Shipbuilding Workers of America and other industrial and craft unions.

Other Area Resources

The College Park Campus is in a region rich in research collections. In the Washington area are the Library of Congress, the National Archives, the Folger Library, the National Library of Medicine, the National Agricultural Library, and various academic and special libraries. In the Baltimore area, in addition to the University's own libraries at UMBC and on the professional campus, are the Enoch Pratt Free Library and the Maryland Historical Association Library. The Maryland Hall of Records is located in Annapolis.

Research Facilities

The research programs at the University derive their existence and vigor from a faculty comprised of internationally recognized scholars and scientists. It is an advantage for undergraduate students to be aware of the University's research facilities as they plan their programs.

Among the exceptional research facilities on the campus are a computer vision laboratory, a scale model nuclear reactor for research and training, a full-scale low velocity wind tunnel, several smaller hypersonic helium wind tunnels, computer-assisted cartographic laboratories, a comfort perception laboratory, a quiescent plasma device (Q machine) for plasma research, satellite remote sensing facilities, transmission and scanning electron microscopes, laboratories for radiation and biochemical reaction research, complete laboratories for the dynamic studies of soils and soil structure, a photomechanics lab, a precision encoder and pattern recognition device, a psychopharmacology laboratory, rotating tanks for laboratory studies of meteorological phenomena, computer simulation and gaming facilities, specialized sound chambers for audiology research, a criminal forensics laboratory, the Astronomy Observatory, a facility for plasma and energy fusion studies, and the Water Resources Center. The University also operates one of the largest and most sophisticated long-wavelength radiotelescopes at Clark Lake in California, as well as a cosmic ray laboratory in New Mexico.

The College Park Campus also received a five-year, $16 million grant from the National Science Foundation to create a new Systems Research Center to facilitate research in artificial intelligence and computer-aided engineering. The Center complements an active program of basic and applied research in computer science supported by four separate IBM and Sperry Univac computer networks.

In addition to these research facilities, the campus supports a number of organized research activities, many of which have received national and international recognition for the quality of their research work. Among the major organized research units on campus are the Bureaus of Business and Economic Research, and Governmental Research; the Center on Aging and Centers for Automation Research, Consumer Research, Educational Research and Development, Family, Housing and Community, Industrial Relations and Labor Studies, Information Sciences Research, Philosophy and Public Policy, Productivity and Quality of Working Life, Renaissance and Baroque Studies, Study and Research in Business and Public Policy, Young Children, and the Engineering Research Center and Survey Research Center, and Institutes for Exceptional Children and Youth, Physical Sciences and Technology, and Research in Higher and Adult Education.

Investigation in agriculture is an important aspect of University research. The Agricultural Experiment Station, which has its headquarters on the College Park Campus, uses its personnel and laboratories at UMCP and UMES, as well as the off-campus research farms (totalling over 3,000 acres) to conduct research in the areas of natural resources and forestry, plants and crops, animals and poultry, economics and rural life, and general resource technology.

Summer Sessions

The College Park Campus offers two summer sessions of six weeks each year. The dates of the Summer Sessions can be found in the printed *Schedule of Classes* for the Summer Session and in the Academic Calendar in Part 1 of this catalog. New freshman applicants who have met the regular University admission requirements for fall enrollment may begin their studies during the summer rather than wait for the next fall term. By taking advantage of this opportunity and continuing to attend summer sessions, the time required for completion of a baccalaureate degree can be shortened by a year or more, depending upon the requirements of the chosen curriculum and the rate of progress.

Many new students have found that attendance during the summer sessions facilitates the transition from secondary school to college. Courses offered during the summer are the same in content and instruction as those offered during the fall and spring semesters.

The Summer Cultural and Recreational Program is an important part of "Summer at Maryland." The Maryland Summer Institute for the Creative and Performing Arts offers a series of programs in art, dance, drama, film, and music, and outstanding performers in these media appear on the College Park Campus. Facilities for most sports and an intramural program in several team and individual sports are available to the students.

For additional information write for a Summer Sessions Catalog, which may be obtained from the Administrative Dean for Summer Programs, College Park, MD 20742.

Accreditation

The University of Maryland is accredited by the Middle States Association of Colleges and Secondary Schools and is a member of the Association of American Universities. In addition, individual schools and departments are accredited by such groups as the American Association of Collegiate Schools of Business, the American Chemical Society, the National Association of Schools of Music, the Section of Legal Education and Admissions to the Bar of the American Bar Association, the Accrediting Council on Education in Journalism and Mass Communications, the American Council on Pharmaceutical Education, the Council on Dental Education of the American Dental Association, the Committee on Accreditation of the American Library Association, the American Psychological Association, the Commission on Accreditation of the Council on Social Work Education, the Council on Medical Education of the American Medical Association, the Engineers Council for Professional Development, the National Council for Accreditation of Teacher Education, the National League for Nursing, the National Architectural Accrediting Board, the American Association for Accreditation of Laboratory Animal Care, and the American Dietetic Association.

Code of Student Conduct and Annotations

Approved by the Board of Regents January 25, 1980

Note: Students subject to disciplinary charges should request a copy of the document *Preparing for a Hearing*, available in the Judicial Programs Office.

(Footnotes which appear throughout the *Code of Student Conduct* refer to the Annotations beginning on page 12.)

Rationale

1. The primary purpose for the imposition of discipline in the University setting is to protect the campus community. Consistent with that purpose, reasonable efforts will also be made to foster the personal and social development of those students who are held accountable for violations of University regulations.[1]

Definitions

2. When used in this code:[2]
   (a) the term "aggravated violation" means a violation which resulted or foreseeably could have resulted in significant damage to persons or property or which otherwise posed a substantial threat to the stability and continuance of normal University or University sponsored activities.
   (b) the term "cheating" means intentionally using or attempting to use unauthorized materials, information or study aids in any academic exercise.
   (c) the term "distribution" means sale or exchange for personal profit.
   (d) the term "fabrication" means intentional and unauthorized falsification or invention of any information or citation in an academic exercise.
   (e) the term "group" means a number of persons who are associated with each other and who have not complied with University requirements for registration as an organization.
   (f) the terms "institution" and "university" mean The University of Maryland College Park.
   (g) the term "organization" means a number of persons who have complied with University requirements for registration.
   (h) the term "plagiarism" means intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise.
   (i) the term "reckless" means conduct which one should reasonably be expected to know would create a substantial risk of harm to persons or property or which would otherwise be likely to result in interference with normal University or University sponsored activities.[3]
   (j) the term "student" means a person taking or auditing courses at the institution either on a full or part-time basis.[4]
   (k) the term "University premises" means buildings or grounds owned, leased, operated, controlled or supervised by the University.
   (l) the term "weapon" means any object or substance designed to inflict a wound, cause injury, or incapacitate, including, but not limited to, all firearms, pellet guns, switchblade knives, knives with blades five or more inches in length, and chemicals such as "Mace" or tear-gas.
   (m) the term "University sponsored activity" means any activity on or off campus which is initiated, aided, authorized or supervised by the University.
   (n) the terms "will" or "shall" are used in the imperative sense.

Interpretation of Regulations

3. Disciplinary regulations at the University are set forth in writing in order to give students general notice of prohibited conduct. The regulations should be read broadly and are not designed to define misconduct in exhaustive terms.

Inherent Authority

4. The University reserves the right to take necessary and appropriate action to protect the safety and well-being of the campus community.[5]

Student Participation

5. Students are asked to assume positions of responsibility in the University judicial system in order that they might contribute their skills and insights to the resolution of disciplinary cases. Final authority in disciplinary matters, however, is vested in the University administration and in the Board of Regents.

Standards of Due Process

6. Students subject to expulsion, suspension[6] or disciplinary removal from University housing[7] will be accorded a judicial board hearing as specified in part 28 of this code. Students subject to less severe sanctions will be entitled to an informal disciplinary conference[8], as set forth in parts 30 and 31.
7. The focus of inquiry in disciplinary proceedings shall be the guilt or innocence of those accused of violating disciplinary regulations. Formal rules of evidence shall not be applicable, nor shall deviations from prescribed procedures necessarily invalidate a decision or proceeding, unless significant prejudice to a student respondent or the University may result.[9]

Violations of Law and Disciplinary Regulations

8. Students may be accountable to both civil authorities and to the University for acts which constitute violations of law and of this code.[10] Disciplinary action at the University will normally proceed during the pendency of criminal proceedings and will not be subject to challenge on the ground that criminal charges involving the same incident have been dismissed or reduced.

Prohibited Conduct

9. The following misconduct is subject to disciplinary action:
   (a) intentionally or recklessly causing physical harm to any person on University premises or at University sponsored activities, or intentionally or recklessly causing reasonable apprehension of such harm.
   (b) unauthorized use, possession or storage of any weapon on University premises or at University sponsored activities.
   (c) intentionally initiating or causing to be initiated any false report, warning or threat of fire, explosion or other emergency on University premises or at University sponsored activities.
   (d) intentionally or recklessly interfering with normal University or University sponsored activities, including, but not limited to, studying, teaching, research, University administration, or fire, police or emergency services.
   (e) knowingly violating the terms of any disciplinary sanction imposed in accordance with this code.
   (f) intentionally or recklessly misusing or damaging fire safety equipment.
   (g) unauthorized distribution or possession for purposes of distribution of any controlled substance or illegal drug[11] on University premises or at University sponsored activities.
   (h) intentionally furnishing false information to the University.
   (i) forgery, unauthorized alteration, or unauthorized use of any University document or instrument of identification.
   (j) all forms of academic dishonesty, including cheating, fabrication, facilitating academic dishonesty and plagiarism.*
   (k) intentionally and substantially interfering with the freedom of expression of others on University premises or at University sponsored activities.[12]
   (l) theft of property or of services on University premises or at University sponsored activities, knowing possession of stolen property on University premises or at University sponsored activities.
   (m) intentionally or recklessly destroying or damaging the property of others on University premises or at University sponsored activities.
   (n) failure to comply with the directions of University officials, including campus police officers, acting in performance of their duties.
   (o) violation of published University regulations or policies, as approved and compiled by the Vice Chancellor for Student Affairs.[13] Such regulations or policies may include the residence hall contract, as well as those regulations relating to entry and use of University facilities, sale or consumption of alcoholic beverages, use of vehicles** and amplifying equipment, campus demonstrations, and misuse of identification cards.

(p) use or possession of any controlled substance or illegal drug on University premises or at University sponsored activities [14]
(q) unauthorized use or possession of fireworks on University premises.

* *Allegations of academic dishonesty are processed in accordance with the procedures set forth in graduate and undergraduate catalogs.*

** *Parking and Traffic Violations may be processed in accordance with procedures established by the Vice Chancellor for Student Affairs.*

Sanctions

10. Sanctions for violations of disciplinary regulations consist of:
(a) EXPULSION: permanent separation of the student from the University. Notification will appear on the student's transcript. The student will also be barred from University premises. (Expulsion requires administrative review and approval by the Chancellor and may be altered, deferred or withheld.)
(b) SUSPENSION: separation of the student from the University for a specified period of time. Permanent notification will appear on the student's transcript. The student shall not participate in any University sponsored activity and may be barred from University premises. Suspended time will not count against any time limits of the Graduate School for completion of a degree. (Suspension requires administrative review and approval by the Vice Chancellor for Student Affairs and may be altered, deferred or withheld.)
(c) DISCIPLINARY PROBATION: the student shall not represent the University in any extracurricular activity or run for or hold office in any student group or organization. Additional restrictions or conditions may also be imposed. Notification will be sent to appropriate University offices, including the Office of Campus Activities.
(d) DISCIPLINARY REPRIMAND: the student is warned that further misconduct may result in more severe disciplinary action.
(e) RESTITUTION: the student is required to make payment to the University or to other persons, groups, or organizations for damages incurred as a result of a violation of this code.
(f) OTHER SANCTIONS: other sanctions may be imposed instead of or in addition to those specified in sections (a) through (e) of this part. For example, students may be subject to dismissal from University housing for disciplinary violations which occur in the residence halls. Likewise, students may be subject to restrictions upon or denial of driving privileges for disciplinary violations involving the use or registration of motor vehicles. Work or research projects may also be assigned.
11. Violations of sections (a) through (g) in part nine of this code may result in expulsion from the University,[15] unless specific and significant mitigating factors are present. Factors to be considered in mitigation shall be the present demeanor and past disciplinary record of the offender, as well as the nature of the offense and the severity of any damage, injury, or harm resulting from it.
12. Violations of sections (h) through (l) in part nine of this code may result in suspension from the University, unless specific and significant mitigating factors as specified in part eleven are present.
13 Repeated or aggravated violations of any section of this code may also result in expulsion or suspension or in the imposition of such lesser penalties as may be appropriate.
14 Attempts to commit acts prohibited by this code shall be punished to the same extent as completed violations.[16]

Interim Suspension [17]

15 The Vice Chancellor for Student Affairs or a designee may suspend a student for an interim period pending disciplinary proceedings or medical evaluation, such interim suspension to become immediately effective without prior notice, whenever there is evidence that the continued presence of the student on the University campus poses a substantial threat to himself or to others or to the stability and continuance of normal University functions.
16. A student suspended on an interim basis shall be given an opportunity to appear personally before the Vice Chancellor for Student Affairs or a designee within five business days from the effective date of the interim suspension in order to discuss the following issues only:
(a) the reliability of the information concerning the student's conduct, including the matter of his identity.
(b) whether the conduct and surrounding circumstances reasonably indicate that the continued presence of the student on the University campus poses a substantial threat to himself or to others or the stability and continuance of normal University functions.

The Judicial Programs Office

17. The Judicial Programs Office directs the efforts of students and staff members in matters involving student discipline. The responsibilities of the office include:
(a) determination of the disciplinary charges to be filed pursuant to this code.
(b) interviewing and advising parties[18] involved in disciplinary proceedings.
(c) supervising, training, and advising all judicial boards.
(d) reviewing the decisions of all judicial boards.[19]
(e) maintenance of all student disciplinary records.
(f) development of procedures for conflict resolution.
(g) resolution of cases of student misconduct, as specified in parts 30 and 31 of this code.
(h) collection and dissemination of research and analysis concerning student conduct.
(i) submission of a statistical report each semester to the campus community, reporting the number of cases referred to the office, the number of cases resulting in disciplinary action, and the range of sanctions imposed.[20]

Judicial Panels

18 Hearings or other proceedings as provided in this code may be held before the following boards or committees:
(a) CONFERENCE BOARDS, as appointed in accordance with part 31 of this code.
(b) RESIDENCE BOARDS, as established and approved by the Vice Chancellor for Student Affairs.[21] Students residing in group living units owned, leased, operated or supervised by the University may petition the Vice Chancellor for authority to establish judicial boards. Such boards may be empowered to hear cases involving violations of this code, as prescribed by the Vice Chancellor for Student Affairs.
(c) THE CENTRAL BOARD hears cases involving disciplinary violations which are not referred to Residence Boards or resolved in accordance with parts 30 and 31 of this code. The Central Board is composed of five full-time students, including at least two graduate students.
(d) THE APPELLATE BOARD hears appeals from Residence boards, the Central Board, and ad hoc boards, in accordance with part 39 of this code. The Appellate Board is composed of five full-time students, including at least two graduate students.
(e) AD HOC BOARDS may be appointed by the Director of Judicial Programs when a Conference Board, a Residence Board, the Central Board, the Appellate Board or the Senate Adjunct Committee are unable to obtain a quorum or are otherwise unable to hear a case.[22] Each ad hoc board shall be composed of three members, including at least one student.
(f) THE SENATE COMMITTEE ON STUDENT CONDUCT hears appeals as specified in part 38 of this code. The committee also approves the initial selection of all judicial board members, except members of conference and ad hoc boards.[23]
19 The presiding officer of each judicial board and of the Senate Adjunct Committee on Student Conduct may develop bylaws which are not inconsistent with any provision in this code. Bylaws must be approved by the Director of Judicial Programs.[24]

Selection and Removal of Board Members

20 Members of the various judicial boards are selected in accordance with procedures developed by the Director of Judicial Programs.
21 Members of conference and ad hoc boards are selected in accordance with parts 31 and 18 (e), respectively.
22 Prospective members of the Central Board and the Appellate Board are subject to confirmation by the Senate Committee on Student Conduct.
23 Members of the Senate Committee on Student Conduct are selected in accordance with the bylaws of the University Senate.
24 Prior to participating in board or committee deliberations, new members of the Senate Adjunct Committee on Student Conduct and of all judicial boards, except conference and ad hoc boards, will participate in one orientation session offered at least once each academic year by the Judicial Programs Office.
25 Student members of any judicial board or committee who are charged with any violation of this code or with a criminal offense [25] may be suspended from their judicial positions by the Director of Judicial Programs during the pendency of the charges against them. Students convicted for any such violation or offense may be disqualified from any further participation in the University judicial system by the Director of Judicial Programs. Additional grounds and procedures for removal may also be set forth in the bylaws of the various judicial panels.

Case Referrals

26 Any person[26] may refer a student or a student group or organization suspected of violating this code to the Judicial Programs Office. Persons making such referrals are required to provide information pertinent to the case and will normally be expected to appear before a judicial board as the complainant.[27]

Deferral of Proceedings

27 The Director of Judicial Programs may defer disciplinary proceedings for alleged violations of this code for a period not to exceed ninety days. Pending charges may be withdrawn thereafter, dependent upon the good behavior of the respondent.

Hearing Referrals

28 Staff members in the Judicial Programs Office will review case referrals to determine whether the alleged misconduct might result in expulsion, suspension, or disciplinary removal from University housing.[28] Students subject to those sanctions shall be accorded a hearing before the appropriate judicial board. All other cases shall be resolved in the Judicial Programs Office after an informal disciplinary conference, as set forth in parts 30 and 31 of this code.

29 Students referred to a judicial board hearing may elect instead to have their case resolved in accordance with parts 30 and 31. The full range of sanctions authorized by this code may be imposed, although the right of appeal shall not be applicable.

Disciplinary Conferences [29]

30 Students subject to or electing to participate in a disciplinary conference in the Judicial Programs Office are accorded the following procedural protections:
- (a) written notice of charges at least three days prior to the scheduled conference.
- (b) reasonable access to the case file[30] prior to and during the conference.
- (c) an opportunity to respond to the evidence against them and to call appropriate witnesses in their behalf.
- (d) the right to be accompanied and assisted by a representative, in accordance with Part 33 of this code.

31 Disciplinary conferences shall be conducted by the Director of Judicial Programs or a designee.[31] Complex or contested cases may be referred by the Director to a conference board, consisting of one member of the Central Board, one member of the Appellate Board, and a staff member in the Division of Student Affairs. Conference Board members shall be selected on a rotating basis by the Director of Judicial Programs.

Hearing Procedures

32 The following procedural guidelines shall be applicable in disciplinary hearings:
- (a) respondents shall be given notice of the hearing date and the specific charges against them at least five days in advance and shall be accorded reasonable access to the case file, which will be retained in the Judicial Programs Office.
- (b) the presiding officer of any board may subpoena witnesses upon the motion of any board member or of either party and shall subpoena witnesses upon request of the board advisor. Subpoenas must be approved by the Director of Judicial Programs and shall be personally delivered or sent by certified mail, return receipt requested. University students and employees are expected to comply with subpoenas issued pursuant to this procedure, unless compliance would result in significant and unavoidable personal hardship or substantial interference with normal University activities.[32]
- (c) respondents who fail to appear after proper notice will be deemed to have pleaded guilty to the charges pending against them.
- (d) hearings will be closed to the public, except for the immediate members of the respondent's family and for the respondent's representative. An open hearing may be held, in the discretion of the presiding officer, if requested by the respondent.
- (e) the presiding officer of each board shall exercise control over the proceedings to avoid needless consumption of time and to achieve the orderly completion of the hearing. Except as provided in section (o) of this part, any person, including the respondent, who disrupts a hearing may be excluded by the presiding officer or by the board advisor.
- (f) hearings may be tape recorded or transcribed. If a recording or transcription is not made, the decision of the board must include a summary of the testimony and shall be sufficiently detailed to permit review by appellate bodies and by staff members in the Judicial Programs Office.
- (g) any party or the board advisor may challenge a board member on the grounds of personal bias. Board members may be disqualified upon majority vote of the remaining members of the board, conducted by secret ballot,[33] or by the Director of Judicial Programs.
- (h) witnesses shall be asked to affirm that their testimony is truthful and may be subject to charges of perjury, pursuant to part 9 (h) of this code.
- (i) prospective witnesses, other than the complainant and the respondent, may be excluded from the hearing during the testimony of other witnesses. All parties, the witnesses, and the public shall be excluded during board deliberations.
- (j) the burden of proof shall be upon the complainant, who must establish the guilt of the respondent by a preponderance of the evidence.[34]
- (k) formal rules of evidence shall not be applicable in disciplinary proceedings conducted pursuant to this code. The presiding officer of each board shall give effect to the rules of confidentiality and privilege, but shall otherwise admit all matters into evidence which reasonable persons would accept as having probative value in the conduct of their affairs. Unduly repetitious or irrelevant evidence may be excluded.[35]
- (l) respondents shall be accorded an opportunity to question those witnesses who testify for the complainant at the hearing.
- (m) affidavits shall not be admitted into evidence unless signed by the affiant and witnessed by a University employee, or by a person designated by the Director of Judicial Programs.
- (n) board members may take judicial notice of matters which would be within the general experience of University students.[36]
- (o) board advisors may comment on questions of procedure and admissibility of evidence and will otherwise assist in the conduct of the hearing. Advisors will be accorded all the privileges of board members, and the additional responsibilities set forth in this code, but shall not vote. All advisors are responsible to the Director of Judicial Programs and shall not be excluded from hearings or board deliberations by any board or by the presiding officer of any board.
- (p) the Director of Judicial Programs may appoint a special presiding officer to any board in complex cases or in any case in which the respondent is represented by an attorney. Special presiding officers may participate in board deliberations, but shall not vote.[37]
- (q) a determination of guilt shall be followed by a supplemental proceeding in which either party and the board advisor may submit evidence or make statements concerning the appropriate sanction to be imposed. The past disciplinary record[38] of the respondent shall not be supplied to the board by the advisor prior to the supplementary proceeding.
- (r) final decisions of all judicial panels shall be by majority vote of the members present and voting. A tie vote will result in a recommended acquittal in an original proceeding. A tie vote in an appellate proceeding will result in an affirmation of the original decision.
- (s) final decisions of all boards, except conference boards, shall be accompanied by a brief written opinion.

Attorneys and Representatives

33. Respondents or complainants participating in any disciplinary proceeding may be accompanied by a representative, who may be an attorney.[39] Parties who wish to be represented by an attorney in a disciplinary proceeding must so inform the Judicial Programs Office in writing at least two business days prior to the scheduled date of the proceeding. Representatives may not appear in lieu of respondents.

Student Groups and Organizations

34. Student groups and organizations may be charged with violations of this code.

35. A student group or organization and its officers may be held collectively [40] or individually responsible when violations of this code by those associated with[41] the group or organization have received the tacit or overt consent or encouragement of the group or organization or of the group's or organization's leaders, officers, or spokesmen.

36 The officers or leaders or any identifiable spokesmen [42] for a student group or organization may be directed by the Vice Chancellor for Student Affairs or a designee to take appropriate action designed to prevent or end violations of this code by the group or organization or by any persons associated with the group or organization who can reasonably be said to be acting in the group's or organization's behalf. Failure to make reasonable efforts to comply with the Vice Chancellor's directive shall be considered a violation of part 9 (n) of this code, both by the officers, leaders or spokesmen for the group or organization and by the group or organization itself.

37. Sanctions for group or organization misconduct may include revocation or denial of recognition or registration, as well as other appropriate sanctions, pursuant to part 10 (f) of this code.

Appeals

38 Any disciplinary determination resulting in expulsion or suspension[43] may be appealed by the respondent to the Senate Committee on Student Conduct. The Senate Committee shall also hear appeals from denials of petitions to void disciplinary records, pursuant to part 48 of this code.

39 Final decisions of residence boards, the Central Board and ad hoc boards, not involving the sanctions specified in part 38, may be appealed by the respondent to the Appellate Board.[44]

40. Requests for appeals must be submitted in writing to the Judicial Programs Office within seven business days from the date of the letter notifying the respondent of the original decision. Failure to appeal within the allotted time will render the original decision final and conclusive.[45]

41 A written brief in support of the appeal must be submitted to the Judicial Programs Office within ten business days from the date of the letter notifying the respondent of the original decision. Failure to submit a written brief within the allotted time will render the decision of the lower board final

and conclusive [46]

42 Appeals shall be decided upon the record of the original proceeding and upon written briefs submitted by the parties. De novo hearings shall not be conducted.

43. Appellate bodies may:
   (a) affirm the finding and the sanction imposed by the original board
   (b) affirm the finding and reduce, but not eliminate, the sanction, in accordance with parts 44 and 44 (a) of this code.
   (c) remand the case to the original board, in accordance with parts 44 and 44 (b).
   (d) dismiss the case, in accordance with parts 44 and 44 (c)

44 Deference shall be given to the determinations of lower boards [47]
   (a) sanctions may only be reduced if found to be grossly disproportionate to the offense.
   (b) cases may be remanded to the original board if specified procedural errors or errors in interpretation of University regulations were so substantial as to effectively deny the respondent a fair hearing, or if new and significant evidence became available which could not have been discovered by a properly diligent respondent before or during the original hearing [48]. The decision of the lower board on remand shall be final and conclusive
   (c) cases may be dismissed only if the finding is held to be arbitrary and capricious [49]
   (d) decisions of the Appellate Board shall be recommendations to the Director of Judicial Programs.[50] Decisions of the Senate Committee on Student Conduct shall be recommendations to the Vice Chancellor for Student Affairs.

45. The imposition of sanctions will normally be deferred during the pendency of appellate proceedings, in the discretion of the Director of Judicial Programs.

Disciplinary Files and Records

46 Case referrals may result in the development of a disciplinary file in the name of the respondent, which shall be voided if the respondent is found innocent of the charges.[51] The files of respondents found guilty of any of the charges against them will be retained as a disciplinary record for three years from the date of the letter providing notice of final disciplinary action.[52] Disciplinary records may be retained for longer periods of time or permanently, if so specified in the sanction.

47 Disciplinary records may be voided[53] by the Director of Judicial Programs for good cause, upon written petition of respondents. Factors to be considered in review of such petitions shall include:
   (a) the present demeanor of the respondent.
   (b) the conduct of the respondent subsequent to the violation.
   (c) the nature of the violation and the severity of any damage, injury, or harm resulting from it.

48 Denials of petitions to void disciplinary records shall be appealable to the Senate Committee on Student Conduct, which will apply the standard of review specified in parts 44 and 44 (c). The requirements for appeals as set forth in parts 40 and 41 shall be applicable.[54]

49 Disciplinary records retained for less than ninety days or designated as "permanent" shall not be voided without unusual and compelling justification.[55]

Annotations:

1. The University is not designed or equipped to rehabilitate or incapacitate persons who pose a substantial threat to themselves or to others. It may be necessary, therefore, to remove those individuals from the campus and to sever the institutional relationship with them, as provided in this code of conduct and by other University regulations.*

   Any punishment imposed in accordance with the code may have the value of discouraging the offender and others from engaging in future misbehavior. In cases of minor disciplinary violations, the particular form of punishment may also be designed to draw upon the educational resources of the University in order to bring about a lasting and reasoned change in behavior. The underlying rationale for punishment need not rest on deterrence or "reform" alone, however. A just punishment may also be imposed because it is "deserved" and because punishment for willful offenses affirms the autonomy and integrity of the offender. The latter concept was well expressed by D.J.B. Hawkins in his essay "Punishment and Moral Responsibility" in 7 Modern Law Review 205.

   > The vice of regarding punishment entirely from the points of view of reformation and deterrence lies precisely in forgetting that a just punishment is deserved. The punishment of men then ceases to be essentially different from the training of animals, and the way is open for the totalitarian state to undertake the forcible improvement of its citizens without regard to whether their conduct has made them morally liable to social coercion or not. But merit and demerit, reward and punishment, have a different significance as applied to men and as applied to animals. A dog may be called a good dog or a bad dog, but his goodness or badness can be finally explained in terms of heredity and environment. A man, however, is a person, and we instinctively recognise that he has a certain ultimate personal responsibility for at least some of his actions. Hence merit and demerit, reward and punishment, have an irreducible individual significance as applied to men. This is the dignity and the tragedy of the human person.

   A similar view was expressed by Justice Powell, dissenting in *Goss v. Lopez* (42 L. Ed. 2d 725, 745):

   > Education in any meaningful sense includes the inculcation of an understanding in each pupil of the necessity of rules and obedience thereto. This understanding is no less important than learning to read and write. One who does not comprehend the meaning and necessity of discipline is handicapped not merely in his education but throughout his subsequent life. In an age when the home and church play a diminishing role in shaping the character and value judgments of the young, a heavier responsibility falls upon the schools. When an immature student merits censure for his conduct, he is rendered a disservice if appropriate sanctions are not applied. . . .

2. An effort is made in the code to use a simplified numbering and lettering system, without use of Roman numerals or subsets of letters and numbers. Any part of the code can be found by reference to one number and one letter (e.g., part 10 (a) explains the meaning of expulsion).

3. Culpable conduct should include conscious acts posing a substantial risk of harm to others (e.g. throwing a heavy object out a tenth-floor window above a sidewalk). If the act itself, however, is unintended (e.g. one is distracted by a noise while climbing a flight of stairs and drops a heavy object) the individual may have failed to use reasonable care, but is not normally deserving of the moral stigma associated with a "conviction" for a disciplinary offense.

4. Former students may be charged for violations which allegedly occurred during their enrollment at the University.

5. Colleges and Universities are not expected to develop disciplinary regulations which are written with the scope or precision of a criminal code. Rare occasions may arise when conduct is so inherently and patently dangerous to the individual or to others that extraordinary action not specifically authorized in the rules must be taken.

6. The terms "suspension" and "interim suspension" are to be distinguished throughout the code and are not interchangeable.

7. Disciplinary removal from University housing should be distinguished from administrative removal for violations of the residence contract. The latter does not leave students with a disciplinary record and does not come under the purview of this code.

8. The standard set forth here represents the minimal procedural protection to be accorded to students charged with most disciplinary violations. Students who are subject to lengthy suspensions or to expulsion may be entitled to more formal procedures, including a hearing with a right to cross-examine the witnesses against them. *Goss v. Lopez* 419 U.S. 565 (1975).

9. The Supreme Court has recently rejected the theory that state schools are bound by principles of federal administrative law requiring agencies to follow their own regulations. *Board of Curators, University of Missouri v. Horowitz* 55 L. Ed. 2d 124, 136. See, generally, "Violations by Agencies of Their Own Regulations" 87 Harvard Law Review 629 (1974).

10. Respondents in disciplinary proceedings may be directed to answer questions concerning their conduct. Students who refuse to answer on grounds of the Fifth Amendment privilege may be informed that the hearing panel could draw negative inferences from their refusal which might result in their suspension or dismissal. If the student then elects to answer, his statements could not be used against him in either state or federal court. *Garrity v. New Jersey* 385 U.S. 493 (1967). See also *Furutani v. Ewigleben* 297 F. Supp. 1163 (N.D. cal. 1969).

11. The "controlled substances" or "illegal drugs" prohibited in this section are set forth in Schedules I through V in Article 27, part 279 of the *Annotated Code of Maryland.*

12. Colleges and Universities should be a forum for the free expression of ideas. In the recent past, however, unpopular speakers have been prevented from addressing campus audiences by students who effectively "shouted them down." Both Yale and Stanford Universities have treated such actions (which are to be distinguished from minor and occasional heckling) as serious disciplinary violations. See the "Report from the Committee on Freedom of Expression at Yale University" which is available in the Judicial Programs Office.

    The following language from the Yale report may be used to elaborate upon the intent and scope of part 9 (k) of this code:

    1 "There is no right to protest within a University building in such a way that any University activity is disrupted. The administration, however,

may wish to permit some symbolic dissent within a building but outside the meeting room, for example, a single picket or a distributor of handbills."

2 "[A] member of the audience may protest in a silent, symbolic fashion, for example, by wearing a black arm band. More active forms of protest may be tolerated such as briefly booing, clapping hands or heckling. But any disruptive activity must stop [and not be repeated] when the chair or an appropriate University official requests silence."

3. "Nor are racial insults or any other 'fighting words' a valid ground for disruption or physical attack. . . . The banning or obstruction of lawful speech can never be justified on such grounds as that the speech or the speaker is deemed irresponsible, offensive, unscholarly, or untrue."

13 A compilation of published regulations which have been reviewed and approved by the Vice Chancellor shall be available for public inspection during normal business hours in the Judicial Programs Office.

14 The "controlled substances" or "illegal drugs" prohibited in this section are set forth in Schedules I through V in Article 27, part 279 of the *Annotated Code of Maryland*.

15. This part and parts twelve and thirteen represent an attempt to give needed guidance to those who are assessing penalties. Moreover, the direction of the guidance is toward imposition of more severe disciplinary sanctions in serious cases. Nonetheless, the language concerning "mitigating factors" is broad enough to give decisionmakers considerable leeway to "do justice", depending upon the facts in each case. The burden of establishing facts in mitigation should, of course, be upon the respondent.

16. There does not seem to be any rational basis for imposing less severe penalties for attempts than for completed violations. The authors of the *Model Penal Code*, for example, have written that:

> To the extent that sentencing depends upon the antisocial disposition of the actor and the demonstrated need for a corrective action, there is likely to be little difference in the gravity of the required measures depending on the consummation or the failure of the plan.

See LaFave, *Criminal Law Treatise* p. 453.

17. These procedures are analogous to those found in the "emergency" disciplinary rules adopted by the Board of Regents in 1971 and are consistent with the formal opinion of the Maryland Attorney General on this subject, dated January 23, 1969. See also *Goss v. Lopez*, 419 U.S. 565 (1975).

Nothing in this provision would prohibit the Vice Chancellor from modifying the terms of an interim suspension, so long as the hearing requirement specified in part 16 was met. For example, a suspended student might be allowed to enter University premises solely for the purpose of attending classes.

18 Staff members in the Judicial Programs Office should endeavor to arrange a balanced presentation before the various judicial boards and may assist both complainants and respondents.

19. This language does not effect any change in previous policy concerning the powers of judicial boards. All board decisions, including those rendered by Conference Boards, shall be treated as recommendations.

20 See annotation one, supra. The deterrent effect of punishment is diminished if the community is unaware of the number and general nature of sanctions imposed. The Director of Judicial Programs may, for example, arrange for publication of the statistical report in the campus press each semester.

21. Boards established pursuant to this section might include modified versions of the present "Greek" or residence hall boards.

22. It is intended that a quorum will consist of three members (out of five). The authority to appoint ad hoc boards should be broadly construed and might be especially useful, for example, when a judicial board or the Senate Committee is charged with hearing a case involving one of its own members. The final determination as to whether a panel is "unable to hear a case" should be within the discretion of the Director of Judicial Programs.

23 The power of confirmation represents a significant grant of authority to the Senate Committee. The committee is presently underutilized and might best contribute to the judicial system by becoming more intimately involved with it. Moreover, confirmation procedures will give committee members direct contact with board members and will also allow the committee to exercise more control over the quality of Judicial Board decisions.

24 Proposed bylaws must be submitted to the Attorney General for review.

25. It could be a public embarrassment for the University to have a student charged with or convicted of a serious crime sit in judgment over other students in disciplinary proceedings. The various state criminal codes are usually so broad and archaic, however, that automatic suspension or removal should not result from any violation of any law (e.g., New York makes it a criminal misdemeanor for anyone "to dance continuously in a dance contest for twelve or more hours without respite").

26 Case referrals should not be limited to members of the "campus community." A student who assaults another person on campus should not escape University judicial action merely because the person assaulted was a visitor (or, as in a recent case, a former student who had just withdrawn from the University.)

27 The Director of Judicial Programs may appoint a trained volunteer from the campus community to serve as the complainant. It would be preferable, however, to employ a "community advocate" to present all disciplinary cases.

Several measures in the code are designed to restore balance in disciplinary proceedings, even in those cases in which the complainant is inexperienced with administrative adjudication:

(a) a hearing officer may be appointed in complex or serious cases. See part 32 (p).

(b) the role of attorneys or advisors may be restricted. See part 33 and annotation 39.

(c) the "disciplinary conference" procedure is designed to eliminate adversary proceedings in minor cases. See parts 30–31 and annotation 29.

28 Staff members may consider the mitigating factors specified in part 11 to determine the permissible sanction to be imposed if the respondent is found guilty of charges. For example, a student involved in a minor altercation might be charged pursuant to part 9 (a), but referred to a disciplinary conference, thereby precluding the possibility of expulsion or suspension for the alleged misconduct.

29 The hearing procedures specified at part 32 need not be followed in disciplinary conferences. Instead a disciplinary conference would normally consist of an informal non-adversarial meeting between the respondent and a staff member in the Judicial Programs Office. Complainants would not be required to participate, unless their personal testimony was essential to the resolution of a dispositive factual issue in the case. Documentary evidence and written statements could be relied upon, so long as the respondent was given access to them in advance and allowed to respond to them at the conference. Respondents would also be allowed to bring appropriate witnesses with them and might be accompanied by a representative, who may participate in discussions, although not in lieu of participation by the respondent.

The conference procedure is designed to reduce the steady growth of unnecessary legalism in disciplinary proceedings. The worst features of the adversary system (including the concept that judicial proceedings are a "contest" to be "won" by clever manipulation of procedural rules) undermine respect for the rule of law. Colleges and universities can and should be a testing ground for development of carefully reasoned alternatives to current procedural excesses in the larger society."

Procedures comparable to the disciplinary conference (referred to as "structured conversations") are suggested by David L. Kirp in his 1976 Stanford Law Review article "Proceduralism and Bureaucracy: Due Process in the School Setting" 38 Stanford Law Review 841:

> The benefits of such conversations in the school setting may better be appreciated by contrasting them with the typical due process hearing. Hearings are designed to determine the facts of a particular controversy, and apply predetermined rules to the facts thus found. At that point, the function of the hearing is at an end. The wisdom of the underlying substantive rules has no relevance, nor is broader discussion of grievances generally encouraged, unless it is somehow pertinent to the dispute at hand.
>
> Conversation knows no such limits. It too serves as a vehicle for resolving what are likely to be factually uncomplicated disputes, but it does more than that. It enables students to feel that they are being listened to and may encourage them to raise underlying grievances. It provides administrators with a relatively inexpensive vehicle for monitoring, and hence a basis for reshaping institutional relationships. The outcome of these 'orderly thoughtful conversations' may well be decisions different in their particulars from what might otherwise have been anticipated; repeated conversations which touch upon similar student grievances may ultimately lead disciplinarians to reassess whether control is so vital, and collaboration so improbable, as a means of assuring institutional order.

The Conference procedure would not be used in any case which might result in any form of separation from the University. Accordingly, the

procedure appears to meet or exceed the due process requirements set forth by the United States Supreme Court for cases involving suspensions of ten days or less. In *Goss v. Lopez* the Court held:

> we stop short of construing the Due Process Clause to require, countrywide, that hearings in connection with short suspensions must afford the student the opportunity to secure counsel, to confront and cross-examine witnesses supporting the charge, or to call his own witnesses to verify his version of the incident. Brief disciplinary suspensions are almost countless. To impose in each such case even truncated trial-type procedures might well overwhelm administrative facilities in many places and, by diverting resources, cost more than it would save in educational effectiveness. Moreover, further formalizing the suspension process and escalating its formality and adversary nature may not only make it too costly as a regular disciplinary tool but also destroy its effectiveness as part of the teaching process.
>
> On the other hand, requiring effective notice and an informal hearing permitting the student to give his version of the events will provide a meaningful hedge against erroneous action. At least the disciplinarian will be alerted to the existence of disputes about facts and arguments about cause and effect. He may then determine himself to summon the accuser, permit cross-examination, and allow the student to present his own witnesses. In more difficult cases, he may permit counsel. In any event, his discretion will be more informed and we think the risk of error substantially reduced (42 L. Ed. 2d 725, 740).

30 The case file consists of materials which would be considered "education records", pursuant to the Family Educational Rights and Privacy Act. Personal notes of University staff members or complainants are not included.

31 Determinations made in accordance with parts 30 and 31 are not appealable.

32 Internal subpoenas may be desirable, since cases have arisen in which complainants or respondents were unable to present an effective case due to the indifference and lethargy of potential witnesses. A student who refuses to respond to a subpoena may be charged with a violation of part 9(n) of the code.

The Director of Judicial Programs should not approve a subpoena unless the expected testimony would be clearly relevant. Likewise, a subpoena designed to embarrass or harass a potential witness should not be authorized.

The subpoena power specified here is not designed to reach documents or other materials.

33 Board members should be disqualified on a case by case basis only; permanent removal should be accomplished in accordance with Part 25. Board members should not be readily disqualified. The term "personal bias" involves animosity toward a party or favoritism toward the opposite party. See, generally, Davis, *Administrative Law Treatise* "Bias" Section 12.03.

34 See *Bernstein v. Real Estate Commission* 221 Md. 221 (1959), which established the "preponderance" standard for state administrative proceedings.

35 Testimony containing hearsay may be heard, if relevant. A final determination should not be based on hearsay alone.

36 Every statement or assertion need not be proven. For example, board members may take notice that many students commute to the University.

37 Student presiding officers are often at a disadvantage when the respondent is represented by an attorney. The proceedings might progress more rapidly and efficiently if a special presiding officer were appointed. Generally, a staff member in the Judicial Programs Office would be selected for such a responsibility, although other University employees with legal training might also be called upon.

38 Information pertaining to prior findings of disciplinary and residence hall violations might be reported, as well as relevant criminal convictions. Prior allegations of misconduct should not be disclosed.

39 A disciplinary hearing at the University is not analogous to a criminal trial. The presiding officer and the board advisor are authorized to exercise active control over the proceedings in order to elicit relevant facts and to prevent the harassment or intimidation of witnesses. No party or representative may use threatening or abusive language, engage in excessive argumentation, interrupt the proceedings with redundant or frivolous objections, or otherwise disrupt the hearing.

Students have not been determined to have a constitutional right to full legal representation in University disciplinary hearings. The privilege of legal representation, granted in this part, should be carefully reviewed in any subsequent revision of the code.

40 Punishment of one or several individuals for the acts of others should be avoided if the identities of the specific offenders can be readily ascertained.

41 Association does not require formal membership. Individuals who might reasonably be regarded as regular participants in group or organization activities may be held to be associated with the group or organization.

42 Leaders or spokesmen need not be officially designated or elected. For example, if a group or organization accepted or acquiesced in the act or statement of an individual associated with it, that individual might reasonably be regarded as a leader or a spokesman for the group or organization.

43 "Suspension" includes deferred suspension but not interim suspension or suspension which is withheld. See annotation six.

44 Students left with a disciplinary record after a disciplinary conference may request that their record be voided, in accordance with part 47. Denials may be appealed, pursuant to part 48.

45 The decision will be "final and conclusive" on the part of the judicial board, but will remain a recommendation to the Director of Judicial Programs.

46. This part is intended to discourage frivolous appeals. Respondents who are genuinely interested in pursuing an appeal can reasonably be expected to prepare a written brief.

47 Appellate bodies which do not give deference (i.e., a presumption of validity) to lower board decisions will distort the entire disciplinary system. Respondents would be encouraged to "test their strategy" and "perfect their technique" before lower boards, since the matter would simply be heard again before a "real" board with final authority.

Lower board members usually have the best access to the evidence, including an opportunity to observe the witnesses and to judge their demeanor. Members of appellate bodies should be especially careful not to modify a sanction or to remand or dismiss a case simply because they may personally disagree with the lower board's decision.

The opportunity to appeal adverse decisions has not been determined to be a requirement of constitutional "due process" in student disciplinary cases.*** There is presently no legal obstacle to adopting an amendment to the code which would eliminate the appellate system altogether.

48 Respondents who obtain information at the hearing which might lead to new evidence are required to request an adjournment rather than wait to raise the matter for the first time on appeal.

49 An arbitrary and capricious decision would be a decision "unsupported by any evidence." The cited language has been adopted by the Federal Courts as the proper standard of judicial review, under the due process clause, of disciplinary determinations made by state boards or agencies. See *McDonald v. Board of Trustees of the University of Illinois* 375 F. Supp. 95, 108 (N.D. Ill., 1974).

50. See annotation 19.

51 Voided files will be so marked, shall not be kept with active disciplinary records, and shall not leave any student with a disciplinary record.

52 Disciplinary records may be reported to third parties, in accordance with University regulations and applicable state and federal law.

53 Void records shall be treated in the manner set forth in annotation 51.

54 The scope of review shall be limited to the factors specified at part 47. An inquiry into the initial determination of guilt or innocence is not permitted. For example, when considering the "nature" of the violation, pursuant to part 47 (c), it is to be assumed that the violation occurred and that the respondent was responsible for it.

55 Some discretion must be retained to void even "permanent" disciplinary records. It may be unnecessary, for example, to burden a graduating senior with a lifelong stigma for an act committed as a freshman. Social norms also change rapidly. "Unacceptable" conduct in one generation may become permissable and commonplace in the next.

* *See the procedures for mandatory medical withdrawal developed by the Vice Chancellor for Student Affairs.*

** *See Macklin Fleming, The Price of Perfect Justice: In our pursuit of . . . perfectibility, we necessarily neglect other elements of an effective procedure, notably the resolution of controversies within a reasonable time at a reasonable cost, with reasonable uniformity . . . . . we impair the capacity of the legal order to achieve the basic values for which it was created, that is, to settle disputes promptly and peaceably, to restrain the strong, to protect the weak, and to conform the conduct of all to settled rules of law.*

*** *See the due process standard set forth in Dixon v. Alabama 294 F.2d 150, 158–159 (Fifth Cir., 1961), Cert. den. 368 U.S. 930.*

Human Relations Code

Article I Purpose

A The University of Maryland College Park affirms its commitments to a policy of eliminating discrimination on the basis of race, color, creed, sex, marital status, personal appearance, age, national origin, political affiliation, physical or mental handicap, or on the basis of the exercise of rights secured by the First Amendment of the United States Constitution. This Code is established to prevent or eradicate such discrimination in accordance with due process within the Campus community. In doing so the Campus recognizes that it must strive actively and creatively to build a community in which opportunity is equalized.

B Accordingly, the Campus Senate of The University of Maryland, College Park Campus, establishes this Human Relations Code to

1 prohibit discrimination as defined in this document within the College Park campus community both by educational programs and, to the extent specified herein, by a formal grievance procedure;
2 establish the responsibilities of the Adjunct Committee on Human Relations of the Senate General Committee on Campus Affairs;
3 establish the responsibilities of the Office of Human Relations Programs in connection with this Code;
4 establish mediation and grievance vehicles within the Divisions of the Campus, in conformity with the Campus Affirmative Action Plan;
5 establish the responsibilities of Equal Education and Employment Opportunity (EEEO) Officers.

C Every effort will be made to make students and potential students, employees and potential employees, faculty members and potential faculty members aware of the opportunities which the Campus provides for every individual to develop and utilize his talents and skills. It is the intent of the Campus to enhance among its students and employees respect by each person for that person's own race, ethnic background or sex, as well as appreciation and respect for the race, ethnic background or sex of other individuals.

D Development of a positive and productive atmosphere of human relations on the Campus shall be encouraged through effective dialogue and broadening of communications channels. The Adjunct Committee on Human Relations and the Office of Human Relations Programs shall provide support and assistance, as authorized, to any individual or group deemed by them to have a positive probable impact in working toward increased understanding among all individuals and groups on the Campus.

E The Senate Adjunct Committee on Human Relations shall advise the Office of Human Relations Programs in recommending policies which fulfill the provisions of this Code. In particular,

1 The Senate Adjunct Committee on Human Relations shall be an adjunct committee of the standing Senate General Committee on Campus Affairs.
2 The purpose of the Senate Adjunct Committee on Human Relations shall be to foster better human relations among all individuals and groups on the Campus, to advise in the development of positive and creative human relations programs, to advise in the prevention and eradication of all forms of discrimination prohibited by this Code, and to make regular assessments of the state of human relations within the purview of this Campus.
3 The functions of the Senate Adjunct Committee on Human Relations may include but are not limited to requesting the Office of Human Relations Programs to conduct investigations of complaints of discrimination because of race, color, creed, sex, marital status, personal appearance, age, national origin, political affiliation, physical or mental handicap, or on the basis of the exercise of rights secured by the First Amendment of the United States Constitution, providing an "open forum" for effective dialogue among all segments of the Campus community, recommending to appropriate Campus bodies educational programs and activities to promote equal rights and understanding; periodically reviewing such programs and activities; initiating studies of Campus-sponsored or recognized programs and activities to determine how improvement can be made in respect to human relations; continually reviewing progress toward these ends and making such further recommendations as experience may show to be needed; and participating to the extent set forth herein in formal human relations grievance actions.

F There shall be an Office of Human Relations Programs directly responsible to the Chancellor. This Office shall plan, develop, give direction to and coordinate the overall Campus effort to prevent and eliminate discrimination based on race, color, creed, sex, marital status, personal appearance, age, national origin, political affiliation, physical or mental handicap, or on the basis of the exercise of rights secured by the First Amendment of the United States Constitution, in all areas of Campus life (this overall effort is referred to herein as the "Human Relations Program"). The Office shall represent, and have direct access to, the Chancellor, and shall cooperate with the Senate Adjunct Committee on Human Relations on substantive matters concerning human relations. The office shall assist and coordinate the human relations activities of the Equal Employment and Educational Opportunity Officers and the equity officers representing the various units of the Campus.

The duties and responsibilities of the Office of Human Relations Programs shall include but not be limited to the following: working with Divisional Provosts, Deans, Directors and Department Chairmen to ensure full compliance in spirit as well as in letter with laws relating to discrimination and with the Campus Human Relations Code; advising Campus offices in their effort to assist personnel to recognize and take advantage of career opportunities within the Campus; working with appropriate offices in the surrounding community on such issues as off-campus housing practices affecting Campus students and employees, transportation, etc.; recommending to the Off Campus Housing Office removal from or reinstatement upon lists of off campus housing, so as to ensure that listed housing is available on a nondiscriminatory basis. (N.B. any final action taken by the University shall be preceded by proper notice to the property owner involved, and an opportunity to be heard); conducting reviews of compliance with the Campus Affirmative Action Plan; initiating and carrying out programs for the elimination and prevention of racism and sexism on Campus; distributing this Code and informing the Campus community of the interpretations of its provisions; sending periodic reports to the Chancellor and to the Senate Adjunct Committee on Human Relations concerning the Human Relations Programs; and participating to the extent set forth herein in formal human relations grievance actions.

G For each of the academic Divisions of the Campus, the Division of Administrative Affairs and the Division of Student Affairs, there shall be an equity officer, who is designated in accordance with the Affirmative Action Plan and who has the duties specified by the Campus Affirmative Action Plan and like duties with respect to the forms of discrimination prohibited by this Code.

Article II Coverage

A Kinds of Discrimination Prohibited:

1 Discrimination in employment, job placement, promotion, or other economic benefits on the basis of race, color, creed, sex, marital status, personal appearance, age, national origin, political affiliation, physical or mental handicap, or on the basis of the exercise of rights secured by the First Amendment of the United States Constitution.
2 Discrimination in criteria of eligibility for access to residence, or for admission to and otherwise in relation to educational, athletic, social, cultural or other activities of the Campus because of race, color, creed, sex, marital status, personal appearance, age, national origin, political affiliation, physical or mental handicap, or on the basis of the exercise of rights secured by the First Amendment of the United States Constitution.

B For the purposes of this Code, "personal appearance" means the outward appearance of any person, irrespective of sex, with regard to bodily condition or characteristics, manner or style of dress, and manner or style of personal grooming, including, but not limited to, hair style and beards. It shall not relate, however, to the requirement of cleanliness, uniforms, or prescribed standards, when uniformly applied for admittance to a campus facility, or when uniformly applied to a class of employees, or when such bodily conditions or characteristics, or manner or style of dress or personal grooming presents a danger to the health, welfare or safety of any individual.

C This Code shall apply to the Campus community. The term "Campus community" is limited to Campus students, faculty, and staff, and to departments, committees, offices and organizations under the supervision and control of the Campus administration.

D Exceptions

1 The enforcement of Federal, State or County laws and regulations does not constitute prohibited discrimination for purposes of this Code. Separate housing or other facilities for men and women, mandatory retirement-age requirements, separate athletic teams when required by athletic conference regulations and political, religious and ethnic/cultural clubs are not prohibited.
2 Discrimination is not prohibited where based on a bona fide job qualification or a qualification required for the fulfillment of bona fide educational or other institutional goals. Complaints concerning the legitimacy of such qualifications may be the subject of human relations grievance actions.
3 The provisions of this Code shall not apply to potential students or potential employees of the University. However, applicants for admission or employment who believe they have been discriminated against by any part of the Campus community may convey such belief together with all relevant facts to the Office of Human Relations Programs, for informational purposes.
4 The grievance procedures under this Code shall not apply to judgments concerning academic performance of students (e.g., grades, dissertation defenses), pending further study and action by the College Park Senate and University Administration.
5 The Campus, with the advice and approval of the Attorney General's Office, shall review on a continuing basis all new laws and regulations which apply to this Campus to determine if any shall require changes in the coverage or exceptions to coverage of this Code.

E This Code shall apply to the Campus community in relation to, but not only to, the following
1. All educational, athletic, cultural and social activities occurring on the Campus or in another area under its jurisdiction;
2. All services rendered by the Campus to students, faculty and staff, such as job placement and job recruitment programs and off-campus listings of housing;
3. University-sponsored programs occurring off campus, including cooperative programs, adult education, athletic events, and any regularly scheduled classes;
4. Housing supplied, regulated, or recommended by the Campus for students, staff and visitors, including fraternities and sororities;
5. Employment relations between the Campus and all of its employees, including matters of promotion in academic rank, academic salary and termination of faculty status, as limited in III.M.

Article III Human Relations Enforcement Procedures

A In order to identify policies or practices which may reflect discrimination, the Senate Adjunct Committee on Human Relations may request the Office of Human Relations Programs to conduct periodic review of the operation of any unit of the Campus. Units shall provide the information necessary for carrying out such reviews. This information shall be submitted through the Chancellor's Office. Any such review under the authority granted in this statement of policy shall be undertaken only after specific authorization of the Chancellor. In the event that the Chancellor fails to authorize an investigation within a reasonable time of the request by the Senate Adjunct Committee on Human Relations, the Chairman of the Committee shall report that fact, together with reasons as he/she may have received from the Chancellor concerning the matter, to the Senate.

B The Office of Human Relations Programs on its own motion shall identify policies, practices or patterns of behavior which may reflect discrimination prohibited by this Code or which may conflict with any other Campus policy concerning human relations or with the Campus Affirmative Action Plan, and shall call these to the attention of the appropriate officials of the unit involved and recommend appropriate action. Those subject to allegations of discrimination shall be afforded all the protections of due process. The Office shall endeavor by negotiation to eliminate the alleged discrimination. Where such efforts fail, the Office may on its own motion report the matter to the Chancellor and to the Senate Adjunct Committee on Human Relations. Documentation of the recommendations by the Office in all such cases shall be maintained on file by the Office.

C To the maximum extent consistent with the purposes of this Code, the confidentiality of personal papers and other records and the principle of privileged communication shall be respected by all persons involved in the enforcement procedures of this Code. Nothing in this Code shall be construed so as to conflict with the requirements of Article 76A of the Maryland Annotated Code. Persons giving information in connection with the procedures described in this Code shall be advised by the person receiving such information of the limits of confidentiality which may properly be observed in Code procedures and that all documents may be subject to subpoena in subsequent administrative or judicial proceedings.

D. Any member of the Campus community who believes that he or she has been or is being discriminated against in ways prohibited by this Code may consult informally and confidentially with the unit EEEO Officer and/or the equity officer and/or the Office of Human Relations Programs prior to filing a formal complaint.

E The Office of Human Relations Programs shall receive formal complaints from any member or group within the Campus community claiming to be aggrieved by alleged discrimination prohibited by this Code and/or any other Campus document or policy relating to human relations practices. Such complaints should give in writing the names of complainant(s) and respondent(s) and the time, the place, and a specific description of the alleged discrimination. Complaints shall be submitted to the Office of Human Relations Programs, or else to the unit EEEO Officer or the equity officer. Complaints must be submitted within one hundred and twenty (120) days of the alleged discrimination act(s), or within one hundred and twenty (120) days of the first date by which the complainant reasonably has knowledge thereof. Complaints not submitted directly to the Office of Human Relations Programs shall be forwarded to the Office of Human Relations Programs within five (5) working days of their receipt. Copies of the complaint shall be forwarded by the Office of Human Relations Programs to the respondent and to the appropriate unit Chairman or Director, Dean, Provost or Vice Chancellor.

F Complainants under this Code shall be required, as a condition precedent, to waive any alternative Campus administrative procedure that may then be available. A complaint which has been heard under some alternative Campus procedure cannot subsequently be heard under the procedure of this Code. In the case of a complaint heard under the Classified Employees Grievance Procedure, this restriction shall apply only when the complaint has entered Step Three of that procedure.

G The Office of Human Relations Programs and/or the equity officer shall ensure that each complainant is informed of his/her right to file the complaint with the appropriate State and Federal agencies. Forms for complaints to State and Federal agencies will be provided or the complainant will be informed where they are available.

H All complaints of discrimination which are not connected with the official functions of the Campus or not falling within the scope of discrimination prohibited by this Code shall be referred to the appropriate Campus, Municipal, County, State, or Federal agencies by the Office of Human Relations Programs.

I. After a complaint has been filed, the Office of Human Relations Programs shall promptly undertake an informal investigation in order to make a preliminary determination as to whether or not the subject matter of the complaint falls within the Code, and whether or not there is probable cause for the complaint. This finding shall be reported to the complainant, the respondent, the Chancellor and the Chairman of the Senate Adjunct Committee on Human Relations. The burden of proof in this investigation and throughout these enforcement procedures rests with the complainant.

J If the finding is that there is not probable cause to believe that discrimination has been or is being committed within the scope of this Code, the Office of Human Relations Programs may dismiss the complaint. Such dismissal shall be reported to the complainant, the respondent, the Chancellor and the Chairman of the Senate Adjunct Committee on Human Relations. The complainant in such a case may appeal the dismissal of the case to the Senate Adjunct Committee on Human Relations, which may direct that a Human Relations Grievance Committee conduct a grievance hearing according to the procedures set forth herein, if in the judgment of the Senate Adjunct Committee on Human Relations there is probable cause to believe that discrimination has been or is being committed within the scope of this Code. The Senate Adjunct Committee on Human Relations shall have access to the complaint file for this purpose. A record of its deliberations shall be placed in the file according to the procedures established by the Office of Human Relations Programs. If the Committee finds no probable cause, it may dismiss the complaint, and report such dismissal to the complainant, the respondent, and the Chancellor.

K. If the finding is that there is probable cause to believe that discrimination has been or is being committed within the scope of this Code, the Office of Human Relations Programs shall endeavor to eliminate the alleged discrimination by conference conciliation and persuasion. If by this process, an agreement is reached for elimination of the alleged discrimination, the agreement shall be reduced to writing and signed by the respondent, the complainant and the Director of the Office of Human Relations Programs. The agreement shall be available to the Chancellor, the equity officer, and to the Chairman of the Senate Adjunct Committee on Human Relations, upon request.

L. If a finding of probable cause is made but no mutually satisfactory solution can be reached under the procedures outlined in Section K immediately preceding, the Office of Human Relations Programs shall initiate the following procedure. The Office shall notify the Senate Adjunct Committee on Human Relations of the failure to reach a mutually satisfactory solution, whereupon, providing the complainant requests in writing a Human Relations Grievance Hearings, a Human Relations Grievance Committee shall be selected according to the procedures described in Article IV following. Grievance hearing shall be closed unless both parties to the dispute agree that the hearing, or any part thereof, shall be open to the public. All parties to the dispute shall be sent within five (5) working days of the written request of such a hearing, written notification of the time and place of the beginning of the hearing and a specific statement of the charges. Hearings shall be held as promptly as is consistent with allowing adequate time for the parties to prepare their cases. Continuances may be granted within the discretion of the Office of Human Relations Programs. All parties shall have ample opportunity to present their facts and arguments in full during the hearing. All findings, recommendations and conclusions by the Grievance Committee shall be based solely on the evidence presented during the hearing, and shall be based on a preponderance of the evidence having probative effect.

The burden of proof rests with the complainant. The Grievance Committee may be assisted by an adviser. All the parties to the dispute and the Grievance Committee may invite persons to testify during the hearing. Each side shall have the right to cross-examine witnesses. Each party has the right to be represented by counsel or other representative, but the University has no obligation to provide such counsel for any party to the dispute. If a party intends to be represented by legal counsel during the hearing, he/she shall inform the Office of Human Relations Programs of this fact no later than 72 hours prior to the hearing, and that Office shall provide that information to the other party or parties. A verbatim record shall be kept of all sessions in which testimony and evidence is presented regarding the case, and this record shall be made available to all parties to the dispute at the conclusion of the proceedings. Upon request the Chairman of the Grievance Committee may, in his discretion, recess the hearing to permit review of the record by one or more parties in the conduct of their case.

The Chairman of a Human Relations Grievance Committee with the advice of the adviser, if there is one, shall rule on all matters of procedure and admissibility of evidence. Any member of the Committee not concurring in the ruling of the chair may request a closed session of the Committee for debate on the point. A majority vote of the Committee will determine the final decision.

Formal rules of evidence shall not be applicable to any hearing before a Human Relations Grievance Committee, and any evidence or testimony which the Committee believes to be relevant to a fair determination of the

complaint may be admitted. The Committee reserves the right to exclude incompetent, irrelevant, immaterial and repetitious evidence.

M In cases of allegations regarding prohibited discrimination concerning academic employment matters, a Human Relations Grievance Committee shall not substitute its judgment of academic competence for the judgment of the appropriate colleagues of the complainant. The function of the Grievance Committee shall be to determine:
   a. whether there were clearly enunciated University, Campus and Departmental standards, policies, procedures and priorities by which to assess the merit of the complaint, and whether the complainant was given a reasonable opportunity to demonstrate his/her academic merit.
   b. whether the stated standards, policies, procedures and priorities were applied to the complainant in a nondiscriminatory manner.

N Within ten (10) working days after hearing all the evidence and arguments, the Human Relations Grievance Committee shall prepare a written decision based solely on the evidence presented at the hearing. This decision shall include a summary of the evidence before the Committee and the Committee's findings as to whether or not a violation of the Code has occurred, and the recommendations of the Committee. Grievance Committees may recommend whatever forms of relief they deem appropriate, but must take due cognizance of the limitations imposed by State law and by the procedures established by the Board of Regents, for example, the procedures by which promotion in academic rank is achieved. Within five (5) working days after the decision has been filed in the Office of Human Relations Programs, the Director of that Office will formally notify all parties to the dispute, the Chancellor and the Senate Adjunct Committee on Human Relations of the decision.

O The Chancellor shall within ten (10) working days of his receipt of the decision of the Human Relations Grievance Committee issue an order specifying what actions, if any, must be taken by individuals or groups found to be guilty of violating the provisions of this Code.

P When a hearing has been scheduled by an outside agency or court, the Office of Human Relations Programs may, with the approval of the Senate Adjunct Committee on Human Relations, prior to the convening of a Human Relations Grievance Committee to hear a case, postpone or terminate the Campus grievance proceedings when such postponement or termination is in its judgment warranted by administrative considerations such as staff limitations and workload, or at the request of a party upon a showing that the Campus hearing will either conflict with the off-Campus hearing, or that participation in the Campus hearing will unreasonably burden a party's preparation of his/her case or otherwise work to his/her prejudice. Such postponement or termination shall be reported to the complainant, respondent and Chancellor. In any case where a complaint has been the subject of prior administrative or judicial resolution or where a complaint becomes the subject of such resolution during the course of proceedings under this Code, the procedures of this Code will not be applicable or will terminate, as the case may be.

Q The Chancellor shall provide a written explanation of his order whenever that order is not in keeping with the findings and recommendations of the Human Relations Grievance Committee. This explanation shall be sent to all parties to the dispute, to the Chairman of the Senate Adjunct Committee on Human Relations, to the Director of the Human Relations Programs and to the Chairman of the Senate. The Chairman of the Senate Adjunct Committee on Human Relations shall report to the Senate Executive Committee concerning the order and explanation at the next meeting of the Executive Committee, and that body shall put the matter on the agenda of the next meeting of the Senate.

R When required by law, copies of the Human Relations Grievance Committee's findings and recommendations and of the Chancellor's order and explanation, if any, shall be sent to the State and Federal agencies charged with enforcement of Article 49B of the Annotated Code of Maryland and the Equal Employment Opportunity Act of 1968 or their successors.

S When a complainant receives a decision on his/her charge of discrimination from a Human Relations Grievance Committee that decision shall not be subject to review under any grievance procedure in force on the Campus.

T No affirmative relief shall be made to a complainant by the University unless the complainant executes the following release as part of a settlement agreement.

The complainant hereby waives, releases and covenants not to sue The University of Maryland or its officers, agents or employees with respect to any matters which were or might have been alleged as charges filed under the Human Relations Code in the instant case, subject to performance by The University of Maryland, its officers, agents and employees, of the promises contained in this settlement agreement.

Article IV Constitution of Human Relations Grievance Committee

A. A Human Relations Grievance Committee shall consist of five (5) members selected by an affirmative vote of at least two (2) members of a Selection Panel consisting of:
   1. The Vice Chancellor of the unit of the Campus within which the alleged discrimination falls. In cases of disputed jurisdiction, decisions as to which Vice Chancellor shall participate will be made by the several Vice Chancellors.
   2. The Director of the Office of Human Relations Programs.
   3. The Chairman of the Senate Adjunct Committee on Human Relations.
   If any of these persons is unable to participate, he or she shall designate a suitable replacement.

B. The selection of a Human Relations Grievance Committee shall be made in such a way as to promote a fair and impartial judgment. An effort shall be made to constitute the Grievance Committee of persons reasonably familiar with the kind of employment or other situation which the case concerns.

C. A determined effort shall be made to gain the consent of complainant and respondent concerning the membership of the Grievance Committee. If in the judgment of the Selection Panel such efforts become unreasonably prolonged, membership will be determined by majority vote of the Selection Panel.

D. None of the members of a Grievance Committee shall have been involved in the action which is the subject of the complaint. This Selection Panel shall remove a member of a Grievance Committee whenever they find that member to have a personal involvement in that case, and may excuse a member from serving on the Grievance Committee on grounds of illness or on other reasonable grounds.

E. Members of the Senate Adjunct Committee on Human Relations shall not be eligible concurrently for inclusion on Human Relations Grievance Committees.

F. The Chairman of a Human Relations Grievance Committee shall be elected by the members of the Committee.

G. Members of a Human Relations Grievance Committee and those officially involved in a hearing shall not be penalized either academically or financially for time missed from work or classes during official meetings of the Committee.

Article V The Equal Education and Employment Opportunity Officer

A. Equal Education and Employment Opportunity Officers shall be instrumental in the implementation of the Human Relations Code within each unit of the College Park campus.

B. Employees on all levels within each unit of the Campus will have access to the assistance of an EEEO Officer. In non-academic divisions, EEEO Officers shall be elected by unit employees under the supervision of the equity officer within whose responsibility the unit falls, or shall be selected by the unit Director in consultation with the appropriate equity officer, in either case in accordance with the Affirmative Action Plan of that unit. EEEO Officers in the academic Divisions shall be chosen in the manner prescribed by the divisional council of each division.

C. The functions of EEEO Officers shall include but not be limited to:
   1. Advising unit administrators with respect to the preparation plans, procedures, regulations, reports, and other matters pertaining to the Campus Human Relations Program.
   2. Evaluating periodically the effectiveness and sufficiency of unit Affirmative Action Plans and other unit plans in relation to the goals of this Code, and reporting these to unit administrators with recommendations as to what improvements or corrections are needed.
   3. Participating in the development of policies and programs within units with respect to hiring and recruitment, training and upgrading, and in all matters pertaining to the elimination of discrimination prohibited by this Code. If a unit fails to develop policies and programs of this nature, it is the task of the EEEO Officer to act in an advocacy role and call this fact first to the attention of the unit administrator, and if no responsive action ensues, then to the Divisional Assistant for Affirmative Action. The EEEO Officer is free at all times to report such cases directly to the Office of Human Relations Programs and the Senate Adjunct Committee on Human Relations.
   4. Serving in a liaison capacity between the unit to which he/she is assigned and all segments of its personnel and attempting to remedy problems brought to his/her attention regarding alleged discrimination.
   5. Advising students or employees of the unit who have reason to believe that discrimination as defined in this Code is occurring. At the request of the aggrieved person the EEEO Officer shall keep any or all aspects of the grievance confidential until a formal complaint has been filed. If the aggrieved so requests, the EEEO Officer shall attempt to resolve the matter, calling upon the assistance of the equity officer where appropriate. The EEEO Officer will keep a record of such advisory and conciliatory activities and periodically brief the equity officer.
   6. Advising and otherwise aiding complainants in making formal complaints under this Code. When a complaint is filed with an EEEO Officer, the complaint shall be forwarded by that officer within five (5) working days to the equity officer and the Office of Human Relations Programs. The EEEO Officer shall be available to assist in a preliminary investigation of the complaint conducted under the general supervision of the Office of Human Relations Programs, to determine whether there is probable cause to believe that prohibited discrimination has occurred.
   7. Making recommendations to the Office of Human Relations Programs to help facilitate human relations programs on Campus.

8 Assisting units in publicizing the functions of EEEO Officers
9 Collecting pertinent information regarding hiring, upgrading and promotion opportunities within units and disseminating such information to appropriate personnel

D The EEEO Officer shall have the full support of the unit administration, the Divisional administration and the Office of Human Relations Programs. The EEEO Officer shall be afforded reasonable time from other regular duties to perform the functions of the office. These functions shall qualify as part of a workday in the case of a staff member and as partial fulfillment of required committee loads in the case of faculty. The EEEO Officer shall be free from interference, coercion, harassment, discrimination or unreasonable restraints in connection with the performance of the duties specified in this Code.

Article VI Effective Date

This Code shall be effective as of October 18, 1976, and shall apply only to those complaints alleging discriminatory acts which occurred on or after that date.

University Policy on Disclosure of Student Records

Buckley Amendment

The University of Maryland adheres to a policy of compliance with the Family Educational Rights and Privacy Act (Buckley Amendment). As such, it is the policy of the University (1) to permit students to inspect their education records, (2) to limit disclosure to others of personally identifiable information from education records without students' prior written consent, and (3) to provide students the opportunity to seek correction of their education records where appropriate.

I. Definitions

A. "Student" means an individual who is or who has been in attendance at The University of Maryland. It does not include any applicant for admission to the University who does not matriculate, even if he or she previously attended the University. (Please note, however, that such an applicant would be considered a "student" with respect to his or her records relating to that previous attendance.)

B. "Education records" include those records which contain information directly related to a student and which are maintained as official working files by the University. The following are not education records.

(1) records about students made by professors and administrators for their own use and not shown to others,
(2) campus police records maintained solely for law enforcement purposes and kept separate from the education records described above,
(3) employment records, except where a currently enrolled student is employed as a result of his or her status as a student;
(4) records of a physician, psychologist, or other recognized professional or paraprofessional made or used only for treatment purposes and available only to persons providing treatment. However, these records may be reviewed by an appropriate professional of the student's choice,
(5) records which contain only information relating to a person's activities after that person is no longer a student at the University.

II. It is the policy of The University of Maryland to permit students to inspect their education records.

A. Right of Access

Each student has a right of access to his or her education records, except confidential letters of recommendation received prior to January 1, 1975, and financial records of the student's parents.

B. Waiver

A student may, by a signed writing, waive his or her right of access to confidential recommendations in three areas: admission to any educational institution, job placement, and receipt of honors and awards. The University will not require such waivers as a condition for admission or receipt of any service or benefit normally provided to students. If the student chooses to waive his or her right of access, he or she will be notified, upon written request, of the names of all persons making confidential recommendations. Such recommendations will be used only for the purpose for which they were specifically intended. A waiver may be revoked in writing at any time, and the revocation will apply to all subsequent recommendations, but not to recommendations received while the waiver was in effect.

C. Types and Locations of Education Records, Titles of Records Custodians

Please note that all requests for access to records should be routed through the Registrations Office (see II D, below).

(1) Admissions
Applications and transcripts from institutions previously attended
a Undergraduate—Director of Undergraduate Admissions, North Administration
b Graduate—Director of Graduate Records, South Administration

(2) Registrations
All on-going academic and biographical records. Graduate and Undergraduate—Director of Registrations, North Administration.

(3) Departments
Departmental offices, Chairmen (Check first with the Director of Registrations) (Miscellaneous records kept vary with the department.)

(4) Deans and Provosts
Deans and Provosts offices of each school. Miscellaneous records.

(5) Resident Life
North Administration, Director of Resident Life. Student's housing records.

(6) Advisors
Pre-Law Advisor, Hornbake Library
Pre-Dental Advisor, Turner Laboratory
Pre-Medical Advisor, Turner Laboratory
Letters of evaluation, personal information sheet, transcript, test scores (if student permits)

(7) Judicial Affairs
North Administration Building, Director of Judicial Affairs. Students' judicial and disciplinary records.

(8) Counseling Center
Shoemaker Hall, Director. Biographical data, summaries of conversations with students, test results. (Where records are made and used only for treatment purposes, they are not education records and are not subject to this policy.)

(9) Financial Aid
Undergraduate—North Administration, Director of Financial Aid
Graduate and Professional Schools—Located in Dean's Offices
Financial aid applications, needs analysis statements, awards made (no student access to parents' confidential statements).

(10) Career Development Center
Undergraduate Library, Director. Recommendations, copies of academic records (unofficial) (note WAIVER section).

(11) Business Services
South Administration Building, Director. All student accounts receivable, records of students' financial charges, and credits with the University.

D. Procedure to be Followed

Requests for access should be made in writing to the Office of Registrations. The University will comply with a request for access within a reasonable time, at least within 45 days. In the usual case, arrangements will be made for the student to read his or her records in the presence of a staff member. If facilities permit, a student may ordinarily obtain copies of his or her records by paying reproduction costs. The fee for copies is $.25 per page. No campus will provide copies of any transcripts in the student's records other than the student's current University transcript; from that campus. Official University transcripts (with University seal) will be provided at a higher charge.

III. It is the policy of The University of Maryland to limit disclosure of personally identifiable information from education records unless it has the student's prior written consent, subject to the following limitations and exclusions.

A. Directory Information

(1) The following categories of information have been designated directory information:
Name
Address
Telephone listing
Date and place of birth
Photograph
Major field of study
Participation in officially recognized activities and sports
Weight and height of members of athletic teams
Dates of attendance
Degrees and awards received
Most recent previous educational institution attended

(2) This information will be disclosed even in the absence of consent unless the student files written notice informing the University not to disclose any or all of the categories within three weeks of the first day of the semester in which the student begins each school year. This notice must be filed annually within the above allotted time to avoid automatic disclosure of directory information. The notice should be filed with the campus registrations office. See II C.

(3) The University will give annual public notice to students of the categories of information designated as directory information.

(4) Directory information may appear in public documents and otherwise be disclosed without student consent unless the student objects as provided above.

(5) All requests for non-disclosure of directory information will be implemented as soon as publication schedules will reasonably allow.

(6) The University will use its best efforts to maintain the confidentiality

of those categories of directory information which a student properly requests not be publically disclosed. The University, however, makes no representations, warranties or guarantees that directory information designated for non-disclosure will not appear in public documents.

B. Prior Consent not Required

Prior consent will not be required for disclosure of education records to the following parties:

(1) School officials of The University of Maryland who have been determined to have legitimate educational interests.
   (a) "School officials" include instructional or administrative personnel who are or may be in a position to use the information in furtherance of a legitimate objective.
   (b) "Legitimate educational interests" include those interests directly related to the academic environment.

(2) Officials of other schools in which a student seeks or intends to enroll or is enrolled. Upon request, and at his or her expense, the student will be provided with a copy of the records which have been transferred.

(3) Authorized representatives of the Comptroller General of the U.S., the Secretary of Education, the Secretary of the Department of Health and Human Services, the Director of the National Institute of Education, the Administrator of the Veterans' Administration, but only in connection with the audit or evaluation of federally supported education programs, or in connection with the enforcement of or compliance with federal legal requirements relating to these programs. Subject to controlling Federal law or prior consent, these officials will protect information received so as not to permit personal identification of students to outsiders.

(4) Authorized persons and organizations which are given work in connection with a student's application for, or receipt of, financial aid, but only to the extent necessary for such purposes as determining eligibility, amount, conditions and enforcement of terms and conditions.

(5) State and local officials to which such information is specifically required to be reported by effective state law adopted prior to November 19, 1974.

(6) Organizations conducting educational studies for the purpose of developing, validating, or administering predictive tests, administering student aid programs, and improving instruction. The studies shall be conducted so as not to permit personal identification of students to outsiders, and the information will be destroyed when no longer needed for these purposes.

(7) Accrediting organizations for purposes necessary to carry out their functions.

(8) Parents of a student who is a dependent for income tax purposes. (Note: The University may require documentation of dependent status such as copies of income tax forms.)

(9) Appropriate parties in connection with an emergency, where knowledge of the information is necessary to protect the health or safety of the student or other individuals.

(10) In response to a court order or subpoena. The University will make reasonable efforts to notify the student before complying with the court order.

C. Prior Consent Required

In all other cases, the University will not release personally identifiable information in education records or allow access to those records without prior consent of the student. Unless disclosure is to the student himself or herself, the consent must be written, signed, and dated, and must specify the records to be disclosed, the identity of the recipient, and the purpose of disclosure. A copy of the record disclosed will be provided to the student upon request and at his or her expense.

D. Record of Disclosures

The University will maintain with the student's education records a record for each request and each disclosure, except for the following:

(1) disclosures to the student himself or herself,

(2) disclosures pursuant to the written consent of the student (the written consent itself will suffice as a record),

(3) disclosures to instructional or administrative officials of the University,

(4) disclosures of directory information.

This record of disclosures may be inspected by the student, the official custodian of the records, and other University and governmental officials.

IV. It is the policy of The University of Maryland to provide students the opportunity to seek correction of their education records.

A. Request to Correct Records

A student who believes that information contained in his or her education records is inaccurate, misleading, or violative of privacy or other rights may submit a written request to the Office of Registrations specifying the document(s) being challenged and the basis for the complaint. The request will be sent to the person responsible for any amendments to the record in question. Within a reasonable period of time of receipt of the request, the University will decide whether to amend the records in accordance with the request. If the decision is to refuse to amend, the student will be so notified and will be advised of the right to a hearing. He or she may then exercise that right by written request to the Office of the Chancellor.

B. Right to a Hearing

Upon request by a student, the University will provide an opportunity for a hearing to challenge the content of the student's records. A request for a hearing should be in writing and submitted to the Office of Registrations. Within a reasonable time of receipt of the request, the student will be notified in writing of the date, place, and time reasonably in advance of the hearing.

(1) Conduct of the Hearing

The hearing will be conducted by a University official who does not have a direct interest in the outcome. The student will have a full and fair opportunity to present evidence relevant to the issues raised and may be assisted or represented by individuals of his or her choice at his or her own expense, including an attorney.

(2) Decision

Within a reasonable period of time after the conclusion of the hearing, the University will notify the student in writing of its decision. The decision will be based solely upon evidence presented at the hearing and will include a summary of the evidence and the reasons for the decision. If the University decides that the information is inaccurate, misleading, or otherwise in violation of the privacy or other rights of students, the University will amend the records accordingly.

C. Right to Place an Explanation in the Records

If, as a result of the hearing, the University decides that the information is not inaccurate, misleading, or otherwise in violation of the student's rights, the University will inform the student of the right to place in his or her record a statement commenting on the information and/or explaining any reasons for disagreeing with the University's decision. Any such explanation will be kept as part of the student's record as long as the contested portion of the record is kept and will be disclosed whenever the contested portion of the record is disclosed.

V. **Right to File Complaint**

A student alleging University noncompliance with the Family Educational Rights and Privacy Act may file a written complaint with the Family Educational Rights and Privacy Act Office (FERPA), Department of Education, 400 Maryland Avenue, S.W., Room 4074, Switzer Building, Washington, D.C. 20202.

Smoking Policy and Guidelines

Effective Spring Semester 1986

Policy

It is hereby established as the policy of the College Park Campus to achieve a public environment as close to smoke-free as practicably possible. Obtaining and maintaining this result will require the willingness, understanding, and patience of all members of the campus community working together.

Guidelines

The following guidelines shall serve to implement the Campus Smoking Policy:

A. *Smoking is prohibited in indoor locations where smokers and non-smokers occupy the same area.* Such areas include:
   1. Academic areas: classrooms, lecture halls, seminar rooms, laboratories, libraries, computing facilities.
   2. Conference rooms, auditoria, exhibition areas, indoor athletic facilities, theaters, pavilions, and retail stores.
   3. Health facilities.
   4. Common/public areas (shared spaces not fully enclosed by floor to ceiling partitions and doors) including: stairwells, elevators, escalators, lobbies, hallways, waiting rooms, reception areas, restrooms, and customer service areas.
   5. Any area in which a fire or safety hazard exists.

B. *Unit heads, or their designees, may establish the following locations as "Smoking Permitted Areas":*
   1. Up to one-third of dining, large lounge and other large open spaces, as long as ventilation is adequate. Smoking of cigars and pipes, however, is prohibited.
   2. Rooms that have closed doors and floor-to-ceiling partitions as long as ventilation is adequate and non-smokers in adjacent areas are not exposed to second hand or side-stream smoke.
   3. The Director of the Stamp Union may, at his/her discretion, allow groups and organizations with permanent offices in the Union to determine the smoking policy in those offices. Such individual policies must adhere to the restrictions set forth in Section III, B, 2 of this policy.

      The Director of the Stamp Union may, at his/her discretion, allow

cigarette smoking by groups making use of the Grand Ballroom, the Colony Ballroom, the Atrium, and other rooms in the Union if he/she determines that it is appropriate to the nature of the event scheduled

C *As a general rule, preferential consideration shall be given to non-smokers whenever it is clear that they are being exposed involuntarily to smoke.*

Compliance

This policy relies on the thoughtfulness, consideration, and cooperation of smokers and non-smokers for its success. It is the responsibility of all members of the campus community to observe this Smoking Policy and Guidelines and to direct those who choose to smoke to designated Smoking Permitted areas.

Complaints or concerns regarding this policy or disputes regarding its implementation should be referred to the immediate supervisor for resolution. If a resolution cannot be reached, the matter will be referred by the supervisor to the appropriate Department Head or Vice Chancellor for mediation.

Other Policies

This Smoking Policy does not supersede more restrictive policies which may be in force in compliance with federal, state, or local laws and ordinances, but shall be in addition thereto.

Administrative Offices

Office of the Chancellor

The Office of the Chancellor is the chief academic and administrative office of the College Park Campus.

Athletics

The Department of Athletics is responsible for directing intercollegiate athletic programs for both women and men.

Women's intercollegiate athletic teams include cross country, field hockey, and volleyball in the fall, basketball, swimming, indoor track, and gymnastics during the winter; and lacrosse and track in the spring. Tennis competition is scheduled in both the fall and the spring seasons. Both men's and women's teams compete in the Atlantic Coast Conference and the National Collegiate Athletic Association (NCAA).

The University of Maryland Department of Intercollegiate Athletics has men's teams in football, soccer, and cross country in the fall; basketball, swimming, wrestling, and indoor track during the winter, and baseball, golf, tennis, lacrosse, and outdoor track in the spring. Maryland is a member of the Atlantic Coast Conference and the National Collegiate Athletic Association (NCAA).

National Collegiate Athletic Association (NCAA) Requirements for Student Athletes

1. NCAA eligibility for regular season competition is based upon satisfactory completion of 24 semester hours of acceptable degree credits since the beginning of the student athlete's last season of competition.
2. The calculation of credit hours shall be based upon hours accepted for degree credit at the institution.
3. Hours earned in summer school may be utilized to satisfy academic credit requirements.
4. Students participating in sports which start competition in the fall semester have that fall, spring, and summer semesters to earn 24 credits.
5. Students participating in sports which start competition in the spring semester have that spring, summer, and fall semesters to earn 24 credits.
6. Credits in courses repeated which were previous F's will count toward the 24 credits.
7. Credits in courses repeated which were previous D's will not count toward the 24 credits.

Office of Human Relations Programs

The Human Relations Office (HRO) is responsible for initiating action in compliance with campus, state, and federal directives designed to provide equal education and employment opportunities for College Park students and employees. It also monitors the outcomes of actions taken in this regard, reporting its findings to the Chancellor, the Campus Senate and to the campus community-at-large.

The HRO both sponsors programs which promote cross-cultural appreciation and processes complaints of discrimination, following procedures set forth in the Campus Human Relations Code. Copies of the Code are available from the HRO and from the Offices of the Vice Chancellors and Provosts of the major divisions. Divisional Equity Officers will provide them on request.

Any student or employee having a concern about possible inequities in educational or employment matters, or who wishes to register a complaint, may also contact a divisional equity officer (see listing below). He/she may also contact the HRO Office in Room 1107 of the Hornbake Library (454–4707/4124).

Minority and/or women students and staff wanting specific information about programs and opportunities available to them within a particular academic or administrative division may contact that division's equity officer. The HRO will provide students and staff with general information on divisional equity efforts and on the status of equity and compliance matters campus-wide.

Campus Equity Officers

HRO Campus Compliance Officer 454–4707/5924
Ms. Gladys Brown—1107 Hornbake Library
Academic Affairs, Office of 454–2052
Dr. Marie Davidson—1119 Main Administration Building
Administrative Affairs, Office of 454–4841
Mr. Lawrence Waters—1132 Main Administration Building
Agricultural and Life Sciences, Division of
Dr. Amel Anderson—1110 Symons Hall 454–5981
Dr. Robert S. Beale—2222 Symons Hall 454–5206
Arts and Humanities, Division of 454–6795
Mr. Kent Cartwright—1101 Francis Scott Key Hall
Behavioral and Social Sciences, Division of 454–5272
Dr. Caroline Cody—2141 Tydings Hall
Human and Community Resources, Division of 454–6064
Dr. Thomas Coley—1120 Francis Scott Key Hall
Mathematical and Physical Sciences and Engineering, Division of . 454–4596
Dr. James Wallace—2300 Mathematics Building
Student Affairs, Office of 454–2925
Ms. Sharon L. Fries—2108 North Administration Building

Office of Institutional Advancement

The Office of Institutional Advancement conducts a variety of programs to develop greater understanding and support for UMCP among its many publics. Under the direction of the Vice Chancellor for Institutional Advancement, the office reports to the Chancellor.

Units of this office include Development, Public Relations/Public Information, Creative Services/Publications, and Alumni Programs. These offices are responsible for all official campus-wide advancement programs such as fund raising, alumni affairs, production of official campus publications, films and video presentations, media relations, and management of major campus events and the Speakers Bureau.

Office of Administrative Affairs

Administrative Affairs is responsible for the effective management of the physical, fiscal, and staff support resources of the campus. It also provides campus safety and security, materials management, administrative computing, and other necessary support services. Of particular interest to students are the community awareness and security programs offered by the University Police and the information and assistance services provided by the Bursar for concerns of students regarding University billings.

Office of Student Affairs

Office of Campus Activities

The Office of Campus Activities provides advising, consultation, and assistance to campus student organizations for the primary purpose of enhancing the educational growth of leaders, members, and associates. Efforts focus on encouragement of involvement in student life activities on campus, establishing various campus programs for the benefit of the University community, and providing various leadership development opportunities. The office maintains records pertaining to student activities and organizations, coordinates the reservation of campus facilities for scheduled activities and manages the funds allocated from the student activities fee. This office also serves as the liaison between Maryland's 50 fraternity and sorority chapters and the University administration. Office location: 1191 Stamp Union. Telephone 454–5605.

Office of Commuter Affairs

The Office of Commuter Affairs, located in Room 1195 of the Stamp Union, has established services to work on behalf, with and for the commuter students at The University of Maryland. In addition to the services described below, the office is actively involved in several research projects and houses the National Clearinghouse for Commuter Programs. Telephone 454–2255.

Off-Campus Housing Service maintains up-to-date computerized listings of rooms, apartments and houses (both vacant and to share). Area maps, apartment directories, and brochures concerning topics of interest to commuter students are available in the office. Telephone 454–3645.

Carpooling . Students interested in forming a carpool can join the individual match-up program by filing out an application at the Office of Commuter Affairs. Student-run regional carpools are given assistance from OCA. Students who carpool with three or more people may apply at OCA for preferred parking.

Shuttle Bus System is operated by the Office of Commuter Affairs for the security and convenience of all students. The bus system offers five distinct programs: Daytime commuter routes, evening security routes, evening security call-a-ride, transit service for the Disabled and charter service. Schedules are available at the Stamp Union Information Desk, the Office of Commuter Affairs, and the Shuttle-UM Office. Telephone 454–5375.

Settling In. UMaps serve as a unique guide to the campus, helping students match their own interests with courses, careers, and opportunities for involvement on campus. Personal copies of UMaps are available in the Office ao Commuter Affairs.

Counseling Center

The Counseling Center provides consultation to a variety of groups and individuals pertaining to educational or psychological issues of concern to them. Available in the reception lobby are occupational and educational information as well as tape-recorded conversations with academic department chairpersons about majoring in their departments. The Counseling Center includes five divisions listed below. Brochures describing these programs and other written materials are available at the Center. Records kept as part of providing counseling services are confidential and not part of the University's educational records. Counseling Center offices are located in the Shoemaker Building.

Counseling Service. Psychologists provide professional individual and group counseling services for students with educational-vocational and emotional-social adjustment concerns. The service also offers a large variety of special counseling workshop programs on such topics as assertion training, reducing smoking, vocational planning, and stress management. Telephone: 454–2931.

Disabled Student Service. Professionals in this office provide services for disabled students including general campus information, assistance in locating interpreters, readers for the blind, and access guides to various buildings and facilities on campus. Telephone 454–5028 (and TTY 454–5029).

Parent Consultation and Child Evaluation Service. Professionals provide consultation, testing, and counseling for youngsters ages 5–14 and families. Telephone: 454–7203.

Reading and Study Skills Laboratory. Educational specialists provide individual and group work for improving academic skills such as reading, writing, listening, notetaking, and how to learn mathematics and science material. Workshops offered by this unit cover such topics as study skills, time management, learning math skills, and exam anxiety. Telephone: 454–2935.

Testing, Research and Data Processing Unit. National testing programs such as the CLEP, GRE and Miller Analogies are administered through this office as well as testing for counseling purposes. In addition, the staff members produce a wide variety of research reports on characteristics of students and the campus environment. Telephone 454–3126.

Dining Services

Dining Services offers several meal plan alternatives to provide flexibility and convenience to students. The plans include the Traditional Board Plan, the Point System, D. S. Cash, and Charge-UM.

Traditional Meal Plan. A choice of 19, 15, or 10 meal plans is available for students who regularly eat in the Dining Halls.

Point System Meal Plan. The *Point System* is designed for the student who does not eat in the dining halls often, and who wants to choose *where, when, how often, and how much* he or she wants to eat.

D. S. Cash Card offers variety and an automatic discount of 10% on all Dining Services locations when an opening deposit of $300 or more is made into the D. S. Cash account.

Charge-UM is Dining Services' new *interest-free* charge plan. A Charge-UM card offers dining at *all Dining Services locations*, including the Rossborough Inn, but paying only one bill.

In addition a number of eateries, snack bars, restaurants, and convenience stores are available to all campus students, faculty and staff.

Students may apply for a meal plan in the Contract Office of Dining Services, Room 0144, South Campus Dining Hall. For additional information, call 454–2905.

Health Center

The University Health Center, located on Campus Drive directly across from the Stamp Union, is open 24 hours a day, seven days a week. Hours vary during semester breaks and holidays.

Students may be seen at the Health Center, by appointment between 8 a.m. and 5 p.m. Monday through Friday. Urgent problems will be treated at any time without an appointment.

Any currently registered student who has paid the health fee is eligible for care. The health fee is included on the student's bill and covers routine health care costs for the semester. However, there are additional charges for special services such as X-ray, laboratory tests, dental treatment, allergy injections, physical therapy, casts, and medication from the pharmacy.

Health services provided by the Center include general medical care, skin care clinic, allergy clinic, sports medicine clinic, men's clinic, women's health clinic, laboratory services, X-ray, social services, pharmacy services, physical therapy clinic, dental clinic, and mental health services. Group and individual health education/counseling is available on topics such as stress, sexual health, alcohol and other drugs, and nutrition. C.P.R. training, peer education and volunteer involvement are also available. For information call 454–4922.

All care and treatment are absolutely confidential. Access to medical records is limited to authorized Health Center personnel, unless written consent for release of information is obtained from the patient.

It is strongly recommended that students maintain some type of health insurance coverage. For those who have no health insurance there is a policy available through the Health Center which covers major medical expenses, including a large portion of hospital costs. Contact the insurance clerk at the Health Center for further information. 454–6750.

For more information concerning Health Center services call 454–3444.

Intramural Sports and Recreation

In their leisure time, thousands of undergraduate and graduate students, faculty and staff members take advantage of the many physical recreation programs conducted by the Intramural Sports and Recreation Staff.

For those who enjoy organized competitive tournaments, men and women (competing separately) may choose from bowling, box lacrosse, cross country, flag football, foul shooting, golf, one-on-one basketball, one-pitch softball, indoor and outdoor soccer, squash singles, weightlifting, and wrestling.

Sports offered for men and for women, as well as on a coed basis, include badminton (singles and doubles), basketball, handball (S & D), horseshoes (S &D), racquetball (S & D), softball, swimming and diving, table tennis (S & D), tennis (S & D), track and field, and volleyball.

Most of the students living on campus compete for their residence unit—dormitory, fraternity, or sorority— while commuters either compete unaffiliated or with friends from their high school, neighborhood, or classes. The ISR staff helps players looking for teams to join and coaches looking for players. Graduate students, faculty and staff may play in the Coed Grad-Fac-Staff League, the Men's Open League, or the Women's League.

For purely recreational purposes, the PERH Building has badminton, basketball, handball, racquetball, squash and volleyball courts available along with weightlifting and matted rooms. The Armory has basketball, volleyball and tennis courts and a ten-laps-to-the-mile running track. There are two swimming pools—in Cole and Preinkert field houses. There are 38 outdoor tennis courts, 32 of which are lighted. Aerobics sessions are conducted daily on a pay-as-you-go basis.

Student employment opportunities abound in ISR as game officials, tournament coordinators, recreation supervisors and utility personnel are needed regularly. No experience necessary. Training is provided.

Special events such as roller skating nights, home-run derby, all-comers indoor track and field meets, and a sports trivia bowl round out the fun-filled program provided by the ISR staff. Meet them in Room 1104 of Reckord Armory or call 454–3124/5454.

Judicial Programs

General Policy

The primary purpose for the imposition of discipline in the University setting is to protect the campus community and to create an atmosphere of personal freedom, in which the rights of all students and staff members are fully protected.

Students may be accountable to both civil authorities and to the University for acts which constitute violations of law and of University regulations. Likewise, an act constituting a violation of the resident hall contract and University regulations may result in removal from University housing, the imposition of disciplinary sanctions, or both.

General Statement of Student Responsibility

Students are expected to conduct themselves at all times in a manner consistent with the University responsibility of ensuring to all members of the community the opportunity to pursue their educational objectives, and of protecting the safety, welfare, rights, and property of all members of the community and of the University itself.

Judicial Programs Office

The Judicial Programs Office directs the efforts of students and staff members in matters involving student discipline. The responsibilities of the office include: 1) determination of the disciplinary charges to be filed against individual students or groups of students, 2) interviewing and advising parties involved in disciplinary proceedings, 3) supervising, training and advising the various judicial boards, 4) reviewing the decisions of the judicial boards, 5) maintenance of all student disciplinary records, 6) collection and dissemination of research and analysis concerning student conduct.

Student judicial board members are invited to assume positions of responsibility in the University discipline system in order that they might contribute their insights to the resolutions of disciplinary cases. Final authority in disciplinary matters, however, is vested in the campus administration and in the Board of Regents.

Disciplinary Procedures

Students accused of violating University regulations are accorded fundamental due process in disciplinary proceedings. Formal rules of evidence, however, shall not be applicable, nor shall deviations from prescribed procedures necessarily invalidate a decision or proceeding, unless significant prejudice to one of the parties may result. University hearing procedures are outlined in the document, *Preparing for a Hearing*, available in the Judicial Programs Office.

Motor Vehicle Administration

Campus Parking Regulations. These regulations are designed to control the flow of traffic, to protect pedestrians, to permit access of emergency vehicles, and to provide parking spaces as fairly and conveniently as possible for students, faculty and staff, and campus visitors. *These regulations apply to anyone operating a motor vehicle on the College Park Campus.*

The Motor Vehicle Administration—The University of Maryland College Park (UMCP-MVA) is the office responsible for administering the provisions of these regulations.

Vehicle Registration

Any motor vehicle (other than a moped) operated on campus by anyone (student, faculty, staff) affiliated with the University must be registered with the UMCP-MVA regardless of the legal ownership of the vehicle. This includes vehicles parked at gray parking meters.

Student Registration

Student vehicle permits will expire on date indicated on permits. Student I.D. card and current state vehicle registration card will be required with applications for permits. All student vehicles *must* display valid permits.

Resident students who have earned fewer than 56 UM accepted semester credits are prohibited from operating a motor vehicle on the College Park Campus and from registering a vehicle, except with special permission. Details are available at the UMCP-MVA Office.

Handicapped Parking

Only vehicles displaying valid *state* issued handicapped license tags and/or window permits, identifying person or passenger as handicapped will be authorized to park in designated handicapped spaces, unpaid parking meters or any ungated parking area on this campus. DAV tags or any *locally* issued tags, windshield permits or decals will not be recognized for this purpose. Contact the UMCP-MVA Office for details. All persons associated with the University displaying *state* issued handicapped parking identification must also display valid UMCP-MVA permits.

Based upon information available to the UMCP-MVA Office, there are instances wherein students are driving vehicles displaying handicapped identification and utilizing designated handicapped parking spaces, meters, and other areas to park even though the student is not handicapped in any manner. Specific information concerning such abuses should be brought to the attention of the UMCP-MVA Office for transmittal to State authorities. The person providing this information should be aware that he/she may be required to provide written/oral information to the investigating agency.

Registration Fees

Vehicles must be registered for the current academic year during the applicable registration period. A registration charge will be made for each vehicle. *This fee is not refundable.*

	Resident Students	*Commuter Students*
Fall Semester:		
First vehicle	$25.00	$20.00
Each additional vehicle	$10.00	$10.00
Spring Semester:		
First vehicle	$13.00	$10.00
Each additional vehicle	$10.00	$10.00
Summer Semester:		
First vehicle	$7.00	$5.00
Each additional vehicle	$10.00	$10.00

Motorcycles are considered in the same category as any other vehicle for the purpose of registration.

Traffic Regulations

All motor vehicles are subject to Maryland Department of Transportation Articles while on the University campus. Maryland State Uniform Citations may be issued by police personnel for violations.

Parking Regulations

a. *The fact that a vehicle is parked in violation of any regulation and does not receive a violation notice does not mean that the regulation is no longer in effect.*

b. *Parking is authorized only in designated parking areas.* It is impossible to mark with signs all areas of University property where parking is prohibited. Parking is absolutely prohibited on grass plots, construction areas, or any place which will mar the landscaping, create a safety hazard or interfere with the use of University facilities (i.e., loading zones, service areas, etc.). *Vehicles parked in violation of this section may be cited and towed at owner's expense.*

c. *Unauthorized vehicles parked in handicapped spaces and/or adjacent transfer areas may be cited and towed at owner's expense.* Only those vehicles displaying valid state handicapped identification are authorized to park in handicapped spaces.

d. Any motor vehicle parked in violation of towable offenses of The University of Maryland College Park regulations or abandoned on campus is subject to removal and impoundment at the expense of the owner or operator. The term abandonment, as it relates to motor vehicles parked on property owned or leased by The University of Maryland, is defined by any of the following conditions:
   (1) Any vehicle which has not been moved for forty-eight (48) hours and whose owner or other claimant the University Police Department is unable to locate.
   (2) Any vehicle which has not been moved for forty-eight (48) hours and whose identified owner or other claimant refuses to move it.
   (3) Any vehicle on which current license plates are not displayed and which has not been moved for forty-eight (48) hours.
   (4) Any vehicle which has not been moved for forty-eight (48) hours due to an inoperative condition caused by the removal of necessary parts or a wrecked condition.
   (5) Vehicles in inoperative condition must be immediately removed from handicapped spaces, fire lanes, roadways and unpaid meters.

e. All UMCP-MVA parking regulations must be observed during registration and examination periods, except as may be otherwise indicated by official control signs. Published notifications during certain exam periods and summer school sessions will be made which would allow student vehicles displaying UMCP-MVA permit to park in *any numbered area* (except Area 19 which is restricted *at all times* and Lot 8 which may be utilized during these times by *compact vehicles only*). Throughout the academic year faculty/staff must utilize their assigned area or authorized overflow area except during official UMCP observed holidays. *Restricted areas are in effect at all times* (this would include such areas as handicapped spaces, fire lanes, roadways, grassy areas, service areas, etc.). Parking meters must be paid as indicated on each meter *at all times*.

f. All vehicles operated on campus must be parked in assigned or authorized overflow areas only, between 7 a.m. and 4 p.m., Monday through Friday, and in any numbered lot or unrestricted faculty-staff lot after 4 p.m. daily and on weekends. All persons must comply with the parking area usage and times which are posted on the signs at the entrance of each area.

g. A vehicle must be parked in one space only, between two parallel white lines, leaving clear access to adjacent spaces, and without blocking vehicles and driving lanes or creating a hazard for other drivers.

h. Parking or stopping is not permitted in driving lanes, on crosswalks or pedestrian ways.

i. Parking or standing on any campus road is prohibited at all times. Unattended vehicles parked in violation of this section may be towed at owner's expense.

j. Parking or standing in any marked fire lane is prohibited at all times. Unattended vehicles parked in violation of this section may be towed at owner's expense.

k. Parking or standing in a service area is prohibited at all times.

l. *Attended* as utilized in these regulations means that the vehicle must be occupied by a licensed driver who would be prepared to move the vehicle should it become necessary.

m. In cases where individuals are permitted to register more than one vehicle for parking on the UMCP campus, only one of these vehicles may be parked on campus at any time.

n. Transfer of parking gate entrance cards is not authorized and could result in revocation of parking privileges in gated areas.

Violation Fees and Penalties

a. Any person associated with the University who operates an unregistered vehicle on the campus will be subject to a payment of an eighteen dollar ($18.00) penalty *in addition* to the penalty for any other regulation violation connected therewith.

b. Any person who registers a vehicle or displays decals or any other UMCP-MVA issued parking permits obtained contrary to the provisions of

these regulations or provides incorrect information to UMCP MVA will be subject to payment of a $50 00 penalty per violation

c Violation of any campus parking regulation other than improper registration will result in penalties as listed below

(1) Parking an unauthorized vehicle in a handicapped space or adjacent transfer area, or in a marked fire lane	$20 00
(2) Parking in a designated Service Area	$20 00
(3) Parking in an area other than an assigned or designated overflow area	$10 00
(4) Parking in a roadway	$10 00
(5) Parking on pedestrian ways, grass areas, plazas, loading zones, driving lanes, and any other places not designated for parking	$15 00
(6) Parking in expired meter spaces (per each meter period)	$5 00
(7) Unauthorized use of *blue* visitor meters (UMCP affiliated persons parking at *blue* meters)	$15 00
(8) Unauthorized use of Courier Meters	$15 00

d Violations are payable within fifteen (15) calendar days from the date of issue at the UMCP-MVA Office during normal hours of operation and at drop boxes located at the Stamp Union Information desk and UMCP-MVA An additional penalty of $2 00 will be imposed for failure to pay violations and towing expenses within fifteen (15) calendar days from date of issue

e Unresolved parking violation notices may be referred to the appropriate state MVA for flagging action and/or towing at the owner's expense

f Flagrant violators of the parking regulations may be referred to the Office of Judicial Programs or appropriate administrative office for action.

Appeals

University of Maryland College Park and University College students may request a Student Traffic Appeals Board (STAB) review by completing and returning the parking violation notice in person to the STAB Office, 2112 North Administration Building, The University of Maryland College Park. *Decisions of the Student Traffic Appeals Board will be final.* Parking meter violations and towing fees will be reviewed by the UMCP-MVA Office. *Alternatively, students may appeal to the Prince George's County District Court (PGCDC) by appropriately completing the necessary information on the back of the parking violation notice to UMCP-MVA, College Park, MD 20742 within 15 calendar days from date of issue.*

Parking violation notices issued to bona fide visitors, persons not students or employees of The University of Maryland College Park may be voided at the discretion of UMCP-MVA. Visitors should complete all relevant information on the back of the parking violation notice and return it, within 15 calendar days of issue, to UMCP-MVA, College Park, MD 20742. All decisions of the MVA Director will be final. *Visitors may request a PGCDC trial in lieu of the written appeal by returning the PVN to UMCP-MVA, College Park, MD 20742 within 15 calendar days from date of issue.*

Unattended vehicles parked or stopped in handicapped/transfer areas (without proper and current state issued handicapped identification), fire lanes, roadways and designated tow areas are subject to being towed at the owner's expense.

Orientation

By early April, or at the time of admission to the University, students will receive material on a program sponsored by the Office of Orientation. The primary purposes of the Orientation program are to provide new students with a general orientation to the University, and to coordinate their academic advisement and course registration. During the program students have the opportunity to interact formally and informally with faculty, administrators, undergraduate student advisors and other new students.

Freshman students may elect to attend a one-day or two-day program. Programs for freshmen are offered during the months of June, July, August and January.

Transfer students are encouraged to attend a one-day program offered in the months prior to the semester of enrollment.

Parents of new students are invited to attend a one-day program specifically designed to introduce parents to the academic, social and cultural milieu of the University. These programs are offered during the months of June, July, August, and January.

Religious Programs

A broad range of religious traditions is represented by the several chaplains and religious advisors at the University. Individually and cooperatively, they offer many services including counseling, worship, student opportunities here and abroad, personal growth groups, and opportunities for service and involvement. Office locations: University Memorial Chapel and 1148 Stamp Union. Telephone: 454–6532.

Resident Life

On-campus housing is available in 36 undergraduate residence halls which are near academic, cultural, social and recreational resources of the campus. All-male, all-female and coeducational living arrangements are available in the halls, which accommodate from 35 to 550 residents. Traditional "dormitory style" residence halls, apartment suites for four or six students, and kitchenless suites for four to seven students are available.

No student may be required to live on campus. Once accommodated, a student may remain in residence halls throughout his or her undergraduate career. Preference is given to single, full-time undergraduates, although graduate and part-time undergraduate students may apply. An application is required. Most of the 8,000 available spaces each year are reserved by returning upperclass students. The number of entering students from whom applications are received each year exceeds the approximately 3,000 spaces which remain. Applicants who cannot be accommodated at the start of classes each fall semester are placed in residence halls throughout the academic year as vacancies are identified. Soon after application is made for housing services, each student is informed of the likelihood of securing accommodations for the start of classes and the advisability of considering other housing alternatives.

The Department of Resident Life is responsible for management of the residence halls as well as for cultural, educational, recreational, and social programming activities. A staff of full-time, graduate and undergraduate employees in each of five residential communities helps to meet community programming, physical environment and administrative needs. These staffs work with other campus and State agencies to provide services and programs in accordance with University and State expectations.

Inquiries should be directed to Information Services, 3118 North Administration Building, Department of Resident Life, The University of Maryland, College Park, MD 20742. Telephone (301) 454–2711.

Stamp Union

The Adele H. Stamp Union is the community center of the College Park Campus for all members of the University: students, faculty, staff, alumni, and their guests. The Union is not just a building, it is also an organization and a program. The Union provides for the services, conveniences, and amenities of the University.

The Union was built and furnished without the help of state or federal funds and is operated as a self-supporting facility, drawing its income from revenue-producing areas and student fees.

Building Hours:

Monday—Thursday	7am–12 midnight
Friday	7am–1am
Saturday	8am–1am
Sunday	12 noon–12 midnight

Stamp Union Services and Facilities:

Services include:

- Art Gallery, Parents Association
- Bank, Citizens Bank and Trust Co. of Maryland
- Bookstore, University Book Center
- Bulletin Boards
- Camping Equipment Rentals, Outhaus
- Campus Reservations
- Copy Machines
- Craft Center
- Display Showcases
- Flower Cart
- Food Services
  - Bakery Stop
  - Banquets and Catering
  - Butcher's Block
  - Cook's Corner
  - Dory's (Ice Cream)
  - Farmers' Market
  - Food Co-op
  - Maryland Deli and Sandwich Factory
  - Oasis
  - Pizza 'n Pasta
  - Pizza Shop
  - Roy Rogers Family Restaurant
  - This 'n That
  - Vending Room
  - What's Your Beef Restaurant
- Information Center
- Lounges
- Meeting Rooms (Size from 8–1000 people)
- Piano Practice Rooms
- Record Coop
- Recreation Center

- Billiards Room
- Bowling Lanes
- Pin Ball and Video Machines
- Table Games Room

STAR (Student Tutorial Academic and Referral) Center
Student Offices
TV Room
Ticket Office
- Campus Concerts
- Ticket Center
- Selected Off-Campus Events

Union Shop (snacks, tobacco, newspapers)
U S Postal Service Automated Facility
William L. Hoff Movie Theater

Directory:

Information Center	454–2801
Administration	454–2807
Bowling and Billiards	454–2804
Dial-an-Event	454–4321
Program Office	454–4987
Reservations—Campus/Chapel	454–4409
Reservations—Union	454–2809
Student Entertainment Enterprises	454–4546
Ticket Office	454–2803
Union Movie Schedule	454–2594

University Book Center

The University Book Center provides an on-campus textbook and supplies retail operation to meet the educational needs of the campus community. The Center also sells clothing and other soft goods, plus novelties, computers, convenience foods, and personal hygiene items.

The University Book Center is located on the basement level of the Stamp Union and is open Monday through Thursday from 8:30 a.m. to 7:30 p.m., Friday from 8:30 a.m. to 4:30 p.m., Saturday from 10 a.m. to 5 p.m., and Sunday from noon to 5 p.m. For additional information, call 454–3222.

Office of Academic Affairs

Undergraduate Admissions

The services offered by the Office of Undergraduate Admissions are designed to meet the individual needs of both prospective and enrolled students. For prospective students, the office provides general information about the College Park Campus through brochures, letters, personal interviews, and campus tours. It also evaluates the applications of both freshman and transfer students in order to select qualified students. The Office of Reenrollment reviews all applications for readmission and reinstatement. Services for enrolled students include acting as a liaison with the academic departments for the evaluation of transfer credits, advanced placement and CLEP scores, and providing any additional general information requested by enrolled students. Please refer to page 28 for more information concerning undergraduate admission.

Office location: Lower level, North Administration Building. Telephone: 454–5550.

Student Financial Aid

The Office of Student Financial Aid administers a variety of financial assistance and student employment opportunities, primarily based on the need of the applicant. The staff of the office is available for individual counseling on matters pertinent to financial planning for college expenses by the students.

See page 37 for more detailed information on opportunities for financial assistance. Office location: Room 2130, North Administration Building. Telephone: 454–3046.

International Education Services

International students and faculty receive a wide variety of services designed to help them benefit from their experience in the United States. International Education Services works very closely with the Office of Undergraduate Admissions by evaluating academic records from overseas and processing applications for English proficiency, visa and financial requirements. Other services provided to the prospective student include special advising and orientations, help with securing housing, information about programs of special international interest, and assistance with the forms that are required for compliance with immigration and other governmental regulations.

Study Abroad Office. American students and faculty receive advisement and information about study, travel and work in other countries. Students may obtain assistance with transfer credits, reenrollment, pre-registration and housing for the semester they return to campus. The University of Maryland offers study abroad programs in Israel and London. Information and advisement are also available about programs through other universities to most areas of the world.

English Language Instruction to Non-native Speakers. The University of Maryland, through the Maryland English Institute, offers two programs of English language instruction for those who are not native speakers of English. For those students who are admissable but require part-time English instruction, the Maryland English Institute offers *semi-intensive* (part-time) instruction. Semi-intensive study would also require the student to enroll in a half-time academic program. Applicants who need more instruction take an *intensive* (full-time) program *before* beginning an academic program. These programs are offered on a semester basis and are also available during the summer. During the summer *only*, semi-intensive instruction is also available to students not admitted to the College Park Campus. For information regarding admission to the intensive Maryland English Institute, contact the International Education Services Office.

The Office of International Education Services is located in Room 2115, North Administration Building. Telephone: 454–3043.

Minority Student Education

The Office of Minority Student Education (OMSE) was officially created on July 1, 1972, as a result of proposals and recommendations submitted to the Chancellor from the Campus Black Community and the Study Commission on Student Life. The office exists to enhance the personal and social development and the academic success of minority students. The office mission is to work together with other resources on campus to provide support services for minority students throughout their college career at The University of Maryland.

Throughout the year OMSE implements several key programs that have as their objective enhancing the recruitment, retention, and graduation of minority students at The University of Maryland. Some of the programs, which constitute a supplemental support system, are the Personal/Social/Academic (PSA) Program, Tutorial Program, Job Fair, and Minority Pre-Professional Academic Societies Program.

The PSA Program is designed to utilize a team approach to prepare minority students for their academic and social experience at The University of Maryland College Park. OMSE, in conjunction with the various divisions and campus units, develops support teams with each consisting of a faculty/staff member, a peer advisor and approximately fifteen students who meet twice a month. These meetings consist of an orientation, rap sessions, workshops, and presentations by resources personnel, all in an effort to provide a sense of community and support for minority students.

The OMSE Tutorial and Advisement Programs are designed to provide assistance to minority students on a walk-in or appointment basis.

The Job Fair, an annual event sponsored by OMSE in conjunction with the Career Development Center, brings representatives from local and national companies to interview students for permanent positions, summer positions, and/or internships. Workshops in resume writing and interviewing techniques are also available for students prior to the Job Fair.

The Minority Pre-Professional Academic Societies Program provides administrative, planning, organizational, and some financial support to eight preprofessional academic societies. Their activities range from high school visits, to workshops, to guest speakers in the respective disciplines.

Another component of the Office of Minority Student Education is the *Nyumburu Community Center.* The Nyumburu (Swahili word meaning "freedom house") Center functions throughout the year to present a wide range of cultural events through a variety of art forms and the humanities. Programs and activities presented by Nyumburu include symposia and workshops conducted by visiting artists and scholars in the areas of creative writing and literature, art, music, drama, and dance. In addition to these activities Nyumburu Center serves as the sponsor of several student clubs and activities.

The OMSE Office Complex contains a study-lounge which offers a relaxed, social atmosphere for students. OMSE is located in Room 1101, Hornbake Library. Telephone: 454–4901. For information about Nyumburu contact: Nyumburu Community Center, South Campus Dining Hall, The University of Maryland, College Park, MD 20742. Telephone: 454–5774.

Records and Registrations

This office provides services to students and academic departments related to the processes of registration, scheduling, withdrawal, and graduation. The office also maintains the student's academic records, and issues transcripts. Telephone: 454–5559. Staff members are available to students for consultation. Location: Registration counter, 1st floor, North Administration Building.

Office of the Administrative Dean for Undergraduate Studies

General. The Office of the Dean for Undergraduate Studies has overall responsibility for undergraduate advisement on the departmental, college and divisional levels. The office maintains the Undergraduate Advisement Center with a staff of advisors for students who have not yet decided upon a major. Advisors are likewise available for students interested in preprofessional preparation for medicine, dentistry and law. Transfer or handicapped students

with special academic problems may also be advised through the office.

This office supervises a number of special academic programs, including the Bachelor of General Studies Degree Program, the General Honors Program and the Individual Studies Program. The office interprets and enforces academic requirements and regulations for undergraduates and administers the program of Credit by Examination.

Academic service components of this office include the Career Development Center, and the Office of Experiential Learning Programs (Cooperative Education, internships, volunteer programs (PACE)).

The Office of the Dean for Undergraduate Studies is located in Room 1115 of the Hornbake Library.

Degree Programs. Two undergraduate majors are directly administered by the Assistant Dean for Undergraduate Studies: General Studies and Individual Studies. Both are designed to provide an alternative academic structure for students whose educational interests, process, or goals do not readily coincide with the requirements of an existing departmental major. Both programs are particularly appropriate for transfer students, older students, and others whose past credits and/or current interests span several fields of study.

The *Bachelor of General Studies* (BGS) program permits students to obtain an education in a broad range of disciplines. Course selection is flexible, but there are limitations on the number of credits allowed from any one department and division.

The *Individual Studies Program (ISVP)* is for students with a clearly defined, well-focused area of interest which crosses departmental lines. The proposed major must be outlined in detail and accepted by a faculty review committee.

More information on both programs can be found under "Campus-wide Programs" in this catalog or from the Office of the Dean for Undergraduate Studies, 1115 Hornbake Library, 454–2530/31.

Career Development Center

General. The Career Development Center (CDC) supports and assists students from all departments in early and systematic consideration of career questions and concerns. *What are my interests, skills and values? What career areas are consistent with these characteristics? How do I select a career objective? Once decided, what are effective strategies in securing a job or graduate school position?* Career Development Center programs and services are designed to be used most effectively by students beginning in the freshman year and continuing through the college years. Students who begin to plan their education and career early in their college experience will be in the best position to place themselves in a meaningful and rewarding position upon leaving The University of Maryland. The Career Development Center is located in Rooms 3112, 3120 and 3121 of the Hornbake Library, South Wing. Phone. 454–2813/14.

Career Development Center Programs

Course: EDCP 108D—Career Planning and Decision Making. This course emphasizes the learning of the lifelong process of career planning. Assignments are chosen to facilitate self and career exploration, to teach effective decision-making applicable to college majors, career and future life and to develop job seeking skills.

Placement Manual and Handouts. The Placement Manual provides detailed, comprehensive information regarding the services offered by the Career Development Center. Career planning, job seeking strategies including resume writing and interviewing techniques are discussed and employers taking part in the On-Campus Recruiting Program are listed. There are also numerous handouts, available to all students, covering a wide variety of career planning topics.

Credentials Service. Credentials are a student's permanent professional record including letters of recommendation and course and resume information. All undergraduate and graduate students are encouraged to develop a file prior to graduation to assist their job or graduate school application process. All senior education majors are required to file credentials.

On-Campus Recruiting Program (O.C.R.P.) Each year 500–600 employers come to campus to interview interested students who are within two semesters of graduation. They primarily represent career fields in business, accounting, computer science, engineering, and sales/marketing. Graduating students seeking placement in other career fields should meet with a career counselor prior to or as early as possible in their final two semesters to map out an effective job search strategy.

Career Library. The Career Library is a fundamental resource for career exploration, decision-making, graduate school planning and job seeking. It contains comprehensive reference material on all aspects of work, education, and career exploration, as well as listings of job vacancies, employer and graduate school information, job seeking guides and videotapes of career workshops.

Career Counselors. Career counselors will assist students in identifying career fields and educational programs suited to their interests and skills, and in developing the skills needed for their job search or career change. Counselors are available with or without an appointment.

Group Programs and Campus-wide Events. Group programs on a wide variety of career development topics run continuously throughout each semester. Job Seeking Skills, The Summer Job Search, Orientation to O.C.R.P. and Interview Preparation are examples. Campus-wide programs including career panels, Employers Forum and Graduate/Professional School Day and Job Fair bring students and representatives together for information exchange and contact.

Office of Experiential Learning Programs

The Office of Experiential Learning Programs (ELP) provides a number of learning opportunities which involve students in the work of the community and the campus. These programs encourage students to test classroom learning in work situations, explore career possibilities by direct participation, and enhance their personal development through work and volunteer experiences. The programs include the following:

Cooperative Education Program in Liberal Arts and Business. This program allows students to alternate semesters of on-campus study with semesters of full-time paid work experience in business or government. To be eligible, a student must have completed 36 semester hours of undergraduate work with at least a 2.0 grade point average. While positions are competitive, and while opportunities are greatest in technical fields, placements are often available in areas of traditional liberal arts majors.

Internships and Field Experience. There are several ways for students to earn academic credit, usually 3–6 hours, through a work experience. Two internship courses, 386 (Field Experience) and 387 (Analysis of Field Experience), are used across the campus. These courses allow students to develop individualized work and learning plans with a sponsoring faculty member. After departmental approval, students must register for these courses concurrently. Students may take the 386/387 sequence only once in any department for a maximum of six credits, and may only take this sequence once in any given semester. In addition, the student must prepare and submit a learning proposal to Experiential Learning Programs by the fourth week of classes the semester of the internship. The maximum number of 386/387 credits applicable toward a baccalaureate degree is 24.

In addition, many academic departments offer their own internship programs. ELP will help students match their interests with existing courses and nearly 2,000 local placements.

Volunteer Service. The ELP Office maintains a listing of nearly 1,000 agencies and organizations which have expressed an interest in having interns or volunteers from The University of Maryland. People Active in Community Effort (PACE) is a student-organized program which provides educationally valuable volunteer service opportunities.

Information about all these programs may be obtained through the Office of Experiential Learning Programs, 0119 Hornbake Library, 454–4767.

Undergraduate Advising Center

Many University students choose to be "undecided" about choice of major. Some want more information about job opportunities before choosing, some may be considering several possible majors, some are trying out a variety of courses, some really don't know what to choose.

Whatever their reason for wanting to be "undecided", these students have an administrative home in the Undergraduate Advising Center. From the center's staff of advisors they can obtain much of the assistance they'll need for career decision-making, academic planning, scheduling, course selection, and a variety of other services.

Preprofessional Advising: offering preprofessional advising for Pre-Law students. For further information on preprofessional advising for Pre-Medical, Pre-Dental and Pre-Allied Health students, consult the Campus-wide Programs section of this catalog.

Trouble Shooting: trouble shooting for individual students who are having difficulty with administrative procedural problems, such as transfer-credit evaluation, schedule revisions, changing Divisions/Colleges/Departments, errors in office records, etc.

Policy Interpretation: keeping advisors informed about new academic policies and helping to interpret existing policies and practices. This service is available to individual students when they come to see us.

Information. maintaining a central file of information about academic programs and requirements on the College Park Campus.

Coordinated Problem-Solving: coordinating the campus-wide system of advising, including helping individual students with specific advising problems.

Credit-By-Exam: administering the campus-wide program of credit-by-examination

General Assistance— giving assistance to a lot of students with different kinds of problems and concerns. Undergraduate Advising Center, Room 1117, Hornbake Library, Phone 454–2733 or 454–3040. Health Professions Advising Office (Pre-Dent/Pre-Med, Allied Health Programs), 454–2540. Credit-by-Exam/CLEP/Advanced Placement, 454–2731.

General Academic Advising

Academic advising is available to all students at College Park. It is the responsibility of the student to make arrangements for advising with the appropriate person.

Advising is an essential part of an undergraduate's educational experiences at The University of Maryland. From orientation to graduation, it can provide the kind of concerned assistance that helps students interpret, often enrich, their perceptions of "being in college." With its emphasis on decision-making, planning, constructive action, effective advising highlights the connections between coursework and career, between learning and doing, between accepting advice and accepting responsibility.

Advantages for Students. As an active and regular participant in existing advising programs, any student can reasonably expect—

(1) to better understand his/her purposes for attending the University;
(2) to develop insights about personal behavior which promotes improved adjustment to the campus setting.
(3) to increase his/her awareness of academic programs and course offerings at College Park,
(4) to more frequently explore opportunities outside the classroom for intellectual and cultural development,
(5) to acquire some decision-making skills that can accelerate academic—and career-planning.
(6) to more realistically evaluate his/her academic progress and its relationship to successful planning.

Required Advising. For most students, advising is not required. This allows individual students to decide, on the basis of personal circumstances and needs, whether or not to see an advisor. Certain categories of students, however, *must* obtain advising assistance:

Students in their first semester registration at College Park. Students who are in their first semester of registration at College Park are urged to meet with an advisor prior to scheduling their courses.

Students Receiving an Academic Warning. Students who receive an "Academic Warning" at the end of any semester will be urged, in writing, to meet with an advisor prior to the beginning of the next semester. Students who do not meet with an advisor will not be allowed to drop or add courses or to register for the following semester.

Students Dismissed from the University. Each student dismissed from the University for academic reasons must, as a condition of reinstatement, meet with an academic advisor. According to the student's individual needs, this meeting may occur before or after reinstatement is granted, in no case, however, may a reinstated student complete registration until the fact of this meeting has been acknowledged/recorded by the advisor.

Students Who Withdraw. Given circumstances deemed appropriate by the Office of Reenrollment, certain students applying for reinstatement following withdrawal may be required to meet with an advisor as a condition of their reinstatement. When this occurs, the fact of the meeting must be acknowledged/recorded by an advisor before registration can be completed. The intent is to require advising of those students who have a record of consecutive withdrawals, withdrawal during a semester following probation, and various other reasons for similar concern.

Students Nearing Senior Status. After a student has earned between seventy and eighty credits toward a baccalaureate degree, that same student shall be urged in writing to meet with an advisor. This meeting is for the express purpose of reviewing the student's progress toward the degree and, at a minimum, requires the advisor to detail, in writing, all coursework yet to be completed in fulfillment of the degree requirements.

Each division, college, and department will have available one or more advisors to meet with these students at the appropriate times.

Finding an Advisor. Undergraduate students at the College Park Campus are encouraged to use the many advisement opportunities that are available to them. At all academic levels—divisional, college, and departmental—at least one person had been designated to coordinate advising. A list of these persons, providing name, room number, and telephone extension is published each semester in the *Schedule of Classes*. Students who are unable to locate an advisor or who have questions about campus advising programs should visit or call the Undergraduate Advising Center, Room 1117, Hornbake Library, 454–2733 or 454–3040.

Honors Programs

A number of special opportunities are available to energetic, academically talented students through the establishment of Honors Programs. The General Honors Program is available to qualified students throughout the campus. In addition there are Department Honors Programs in approximately 30 academic departments and colleges.

General Honors is intended to allow the students to pursue their general education at a challenging, demanding level. Students can engage, with others of similar ability and varied interests, in a program whose emphasis is on interdisciplinary and educationally broadening activity. These studies complement the students specialized work in whatever field. Departmental Honors Programs offer students the opportunity to pursue more deeply their studies in their chosen fields of concentration.

Both programs offer challenging academic experiences characterized by small classes, active student participation, and an Honors faculty that encourages dialogue. Individually guided research, field experience and independent study are important aspects of Honors work.

Many students enter the General Honors Program as freshmen. They are selected on the basis of high school records, standardized test scores, personal achievements, and other evidences of ability and motivation. Undergraduates already on campus, majoring in any department, college, or division, and transfer students, are also encouraged to apply for admission. Departmental Honors Programs usually begin in the junior year, though some start earlier.

Students who successfully complete the Honors curriculum graduate with a citation in General or Departmental Honors, or both. For information about Departmental Programs, students should contact the department, for information about the General Honors Program write to Dr. John Howarth, Director, Honors Program, The University of Maryland, College Park, MD 20742.

Honor Societies.

Students who excel in scholarship and leadership may be invited to join the appropriate honor society. For information, contact the Administrative Dean for Undergraduate Studies or the Undergraduate Advising Center. Honor societies at the College Park Campus include the following:

Alpha Epsilon (Agricultural Engineering)
*Alpha Kappa Delta (Sociology)
*Alpha Lambda Delta (Scholarship—Freshman)
Alpha Zeta (Agriculture)
Beta Alpha Psi (Accounting Major in Business and Management)
Beta Gamma Sigma (Business and Management)
Delta Nu Alpha (Transportation)
Delta Phi Alpha (National German Honors Society)
Eta Beta Rho (Hebrew)
*Eta Kappa Nu (Electrical Engineering)
Gamma Theta Upsilon (Geography)
Iota Lambda Sigma (Industrial Education)
Kappa Delta Pi (Education)
Kappa Tau Alpha (Journalism)
*Mortar Board (Scholarship and Leadership)
Omega Chi Epsilon (Chemical Engineering)
Omega Rho (Business and Management)
Omicron Delta Epsilon (Economics)
*Omicron Delta Kappa (Scholarship and Leadership)
Omicron Nu (Home Economics)
Phi Alpha Epsilon (Physical Education, Recreation and Health)
*Phi Alpha Theta (History)
Phi Beta Kappa (Liberal Arts and Sciences)
*Phi Eta Sigma (Scholarship—Freshman)
*Phi Kappa Phi (Senior and Graduate Scholarship)
*Phi Sigma (Biology)
*Phi Sigma Iota (French and Italian)
Pi Alpha Xi (Floriculture)
Pi Mu Epsilon (Mathematics)
Pi Pi (Slavic Languages)
Pi Sigma Alpha (Political Science)
*Psi Chi (Psychology)
Salamander (Fire Protection Engineering)
Sigma Delta Chi (Society of Professional Journalists)
Sigma Delta Pi (Spanish)
Sigma Gamma Tau (Aerospace Engineering)
Sigma Phi Alpha (Dental Hygiene)
*Tau Beta Pi (Engineering)

* *Members of Association of College Honor Societies*

Election to Phi Beta Kappa

Organized in 1776, Phi Beta Kappa is the oldest and most widely respected honorary society in the United States. Only twelve percent of American colleges and universities have been granted chapters and thus can elect their graduates to membership.

Invitation to membership is based on outstanding scholastic achievement in studies of the liberal arts and sciences. Student members are chosen entirely on the basis of academic excellence, neither extra-curricular leadership nor service to the community is considered.

New members are nominated by a committee of six faculty members who represent in equal number the natural sciences, the social sciences and the humanities. Final election to membership is by vote of the resident members of the University of Maryland Gamma Chapter (that is, faculty members who are members of Phi Beta Kappa). No more than ten percent of the liberal arts and sciences graduates may be elected each year.

Requirements for consideration include the following:

1. *Residence.* At least half the credit hours required for graduation must be taken at The University of Maryland College Park.
2. *Liberal Courses.* Three-fourths of the hours required for graduation (i.e., 90 hours) must be in liberal arts or liberal sciences. Liberal courses means courses that are theoretical and academic, not professional or applied.
3. *Required Courses.* One semester of mathematics and two semesters of a foreign language are required unless equivalent knowledge is shown through examination.
4. *Grade Point Average.* The student must have attained a grade point average of at least 3.5 in all the liberal courses taken.
5. *Distribution of Courses.* The credit hours presented for graduation must be more evenly distributed among the natural sciences, the social sciences, and the humanities than the University requires for graduation under the University Studies Program. Minimal qualifications in more than one area may preclude election. Students with strong courses, broad distribution, and moderately high grade point averages are preferred to those with a very high grade point average in a narrow range of courses.

   At least one laboratory course in the natural sciences is desirable. Harder courses will count more than easy ones. In the social sciences and the humanities, some traditional courses which require reading books and writing papers are expected. Internships may be counted as professional, rather than liberal, courses.
6. *Junior Election.* A very small number of students are elected at the end of their junior year instead of the semester in which they are graduated. They must have at least a 3.75 grade point average, and fulfill the same distribution requirements as seniors.

Meeting the above requirements does not guarantee election to Phi Beta Kappa. The judgment of the Committee on the quality, depth and breadth of the student's record is the deciding factor in every case.

Students who are in doubt about equivalency examinations in math and foreign language or about what courses are counted as liberal should visit the Phi Beta Kappa Office, Room 2110, South Administration Building, or telephone 454–4981.

Commencement Honors

Honors for excellence in scholarship are determined by the highest 2 percent (Summa cum Laude), the next 3 percent (Magna cum Laude), and the following 5 percent (cum Laude) of the students of the preceding three commencements of each degree-granting unit. To be eligible for this recognition, a total of at least 60 semester credits earned at The University of Maryland is required. Of these 60 credits, at least 30 credits must have been earned at the College Park Campus. The computation of the cumulative grade point average does not include grades for courses taken during the last semester of registration before graduation, although the hours earned for that semester will apply toward the 60-hour requirement. No student with a grade point average less than 3.000 will be considered.

2 Admissions, Fees, and Academic Requirements

Admission Requirements for Undergraduates

Fall 1986 and Spring 1987

The University of Maryland is a publicly-supported land grant institution dedicated primarily to the educational needs of Maryland residents. Within its responsibilities as a State facility, the University attracts a cosmopolitan student body and each year offers admission to a number of promising men and women from other states and jurisdictions. Currently, 50 states, the District of Columbia, 2 territories, and 100 foreign countries are represented in the undergraduate population. Admissions policies for the upcoming semesters are determined by the Board of Regents.

Freshman Admissions Criteria: Maryland Residents

Admission to the College Park Campus is competitive. The admissions decision is based primarily on grades earned in academic subjects beginning with the ninth grade, SAT composite scores on any single administration, and completion of specific high school courses.

All freshmen are expected to have completed a rigorous high school curriculum. Applicants meeting preferred admissions standards, which generally require a minimum of a 3.0 academic grade point average and a SAT composite score of at least 1,000, are encouraged to apply and are guaranteed admission. All other freshmen are urged to apply as early as possible to ensure full consideration for admission and other services.

Individual Admissions

Maryland residents who do not meet the established criteria may be considered via the Individual Admission Program. The evaluation will take into account personal histories and extracurricular accomplishments. Application forms for this program will be sent to all appropriate individuals. Personal recommendations from high school personnel and responsible members of the community will also be reviewed. Individual admissions shall be limited to 15 percent of the new freshman class University-wide. Each campus of the University will develop the criteria by which individual admissions will be administered. For information pertaining to this category, please contact the Office of Undergraduate Admissions.

Use of Mid-Year Grades

The University will reserve a decision on the applications of Maryland residents who do not meet the criteria outlined above until mid-year grades are available for the senior year in high school. The College Park Campus is unable to utilize the final high school marks in rendering decisions for applicants who are applying for admission directly from high school.

If mid-year grades for the senior year in high school are available when an application is initially considered by the College Park admissions staff, they will be used in determining eligibility for admission.

Subjects Used for Computation of the High School Academic Grade Point Average

Because of variations in course titles in the secondary school systems, this listing is not inclusive. It does, however, provide examples of the types of courses the College Park Campus utilizes in computing the high school academic grade point average.

English. Composition, Communications, Creative Writing, Conversational Language, Debate, Expressive Writing, Journalism, Language Arts, Literature, Public Speaking, Speech, World Literature.

Foreign Languages. French, German, Greek, Hebrew, Italian, Latin, Russian, Spanish, Other.

Mathematics. Advanced Topics, Algebra I, Algebra II, Analysis (or Elementary Analysis), Analytic Geometry, Calculus, Computer Math, Functions, Geometry, Mathematics II, Mathematics III, Mathematics IV, Matrices, Probabilities, Modern Geometry, Probability and Statistics, E A M (Rev. Acad. Math), S M S G., Modern Math, Trigonometry.

Science. Advanced Biology, Advanced Chemistry, Biology, Chemistry, Earth Science, General Science, Genetics, Geology, Laboratory Science, Physical Science, Physics, Space Science, Zoology.

Social Studies. Afro-American Studies, American History, Ancient History, Anthropology, Child Development, Civics-Citizenship, Contemporary Issues (C.I.S.S.), Cultural Areas, Cultural Heritage, Economics, Economic Citizenship, Ethics (if considered to be Religion, not counted), European History, European History and Survey, Family Living, Far East, Pan American, Geography, Government, Humanities, International Affairs, Medieval History, Modern History, Modern Problems, National Government, Philosophy, Political Science, Problems of Democracy, Problems of 20th Century, Psychology, Sociology, State History, U.S. History, World Civilization, World Cultures.

Special Admission Options

To serve students who are not typical freshmen, the College Park Campus has developed a variety of non-traditional admissions options:

Admission Options for High Achieving High School Students

1. *Concurrent Enrollment.* High school seniors who have earned a minimum 3.50 (B+) average in academic subjects during grades ten and eleven may enroll on the College Park Campus for two courses or seven credits each semester. They must file a "concurrent admissions" application and transcripts. The permission of the high school is required and students must live within commuting distance. Fees are assessed on a per-credit hour basis.
2. *Summer Enrollment.* High school students with minimum 3.00 (B) averages may enroll for courses during the summer preceding their junior or senior year. They must file a regular application and transcripts. Fees are assessed on a per-credit hour basis.
3. *Early Admission.* Although The University of Maryland generally requires applicants to earn a high school diploma prior to their first registration, the College Park Campus will admit well-qualified students without this document provided:
   a. they have a minimum B (3.0) average in academic subjects.
   b. the student is within four semester courses (two credits) of high school graduation.
   c. the student has the commitment of the high school and the superintendent of schools, when appropriate, to award a high school diploma after successfully completing the freshman year.
4. *Gifted Student Admission.* The University admits a limited number of gifted students who have completed at least the seventh grade, have an SAT combined score of 1200, and have a superior academic record. Students must have an initial admissions conference with a member of the Undergraduate Admissions staff. The Admissions staff may, if it is deemed helpful to the admissions decision, make referrals for further assessment to campus counseling services.

High School Equivalence Examination

Maryland residents who are at least 16 years of age and who have not received a high school diploma may be considered for admission, provided they have earned the high school General Education Equivalency (GED) certificate. In order to be admitted, the applicant must present an average score of 50 with no score below 40 on any of the five parts of the test. Alternately, a minimum score of 45 on each of the five parts of the test is also acceptable.

Non-Accredited Maryland High Schools

There are specific SAT and GPA requirements for applicants from non-accredited Maryland high schools.

All students who are admitted to the University from non-accredited high schools will be enrolled with a "conditional status". Conditional status will be removed, providing the student completes 24 credits and maintains at least a 2.0 cumulative grade point average. For more information, contact an admissions counselor.

Freshman Admission Requirements: Out-of-State Freshman

The University is committed to developing a cosmopolitan student body. Therefore, applications from jurisdictions other than Maryland are welcome. Generally, a successful out-of-state applicant must have higher than average SAT scores and high school grades.

Other Requirements for All Freshman Applicants

In general the College Park Campus requires freshman applicants to earn a high school diploma prior to their first registration at the University. Applicants should see that their final high school transcripts are sent to the Office of Undergraduate Admissions prior to enrolling. *All admissions are contingent upon satisfactory completion of current work.*

The SAT examination is required of all freshman applicants. Test results must be submitted *directly* to the College Park Campus by the Educational Testing Service. The applicant is strongly urged to include his/her social security number when registering for the SAT. This will expedite processing of the application for admission by the College Park Campus. The reporting code for the College Park Campus is 5814. The University strongly recommends that the SAT be taken as early as possible. The January test is generally the latest acceptable examination for fall applicants. Further information on the SAT may be obtained from high school guidance offices or directly from the Educational Testing Service, Princeton, New Jersey 08540.

Designated Preparation for Admission

Students will be required to successfully complete specified high school courses as a prerequisite for admission to the University. Beginning with the summer and fall of 1984, and thereafter, a program of required high school academic coursework will be phased in. This will be a condition for both Preferred and Regular Admission. Each undergraduate campus of the University may choose to exceed the minimum requirements outlined below:

Fall 1986

English—4 years
Social Science/History—3 years
Science—2 years, one of which must be laboratory based
Mathematics—2 years, equivalent at least to Algebra I and Plane Geometry

Fall 1987

English—4 years
Social Science/History—3 years
Science—2 years, both courses will be laboratory based
Mathematics—2 years, equivalent at least to Algebra I and Plane Geometry

Fall 1988

English—4 years
Social Science/History—3 years
Science—2 years, both courses will be laboratory based
Mathematics—3 years, at least equivalent to Algebra I, II and Plane Geometry

Students are strongly encouraged to take at least 2 years of a foreign language and a fourth year of mathematics. Please contact the Office of Undergraduate Admissions for further information.

Proficiency Examination Programs

Whether you are a new student, a continuing or returning student, the College Park Campus offers several opportunities to earn college credit through satisfactory achievement in a variety of examinations. Proficiency examinations are considered as resident credits.

Currently, undergraduate students may earn credit through various proficiency examination programs up to a total of one-half of the credits required for their degree. It is the student's responsibility to consult with the appropriate divisional officer, dean and advisor with regard to applicability of any credit earned by examination to a specific degree program and to determine courses which should *not* be elected in order to avoid duplication. *A student will not receive credit for both passing an examination in a course and completing the same course.*

Students with specific questions about the University's policy may contact the Director, Special Advising Programs, Room 1117, Hornbake Library (454–2731).

Three proficiency examination programs are recognized for credit by the College Park Campus: College Level Examination Program (CLEP), Departmental Proficiency Examinations (Credit by Examination), and the Advanced Placement (A.P.) Program. Credits earned under the Credit by Examination Program are considered to be resident credits while credits earned through the CLEP and AP programs are treated as transfer credits. For descriptions of CLEP and the Credit by Examination Programs, please consult the descriptions of these programs under Academic Regulations and Requirements.

Advanced Placement Program (A.P.). Students must take A.P. examinations *before* graduating from high school. Testing for the A.P. program is conducted in late April or May of each year. The Advanced Placement Program of the College Entrance Examination Board is accepted by the College Park Campus. Detailed information concerning the examinations and registration may be obtained from the high school guidance counselor or from the Director of Advanced Placement Program, College Entrance Examination Board, 888 Seventh Avenue, New York, N.Y. 10018.

Students intending to enroll at College Park should have the results of their A.P. examinations forwarded to the Office of Admissions, University of Maryland, College Park 20742.

A.P. Examinations Accepted for Credit at UMCP

General Statement. If Advanced Placement credits are already on a student record from an institution outside The University of Maryland System, the score must be equivalent to a minimum University score, otherwise, the credit will not be considered for transfer.

Biology. For achievement of a score of 5 or 4, eight hours of credit are granted. The student may not take BOTN 101 or ZOOl 101 for credit; the student may take any course for which BOTN 101 or ZOOL 101 is prerequisite. For achievement of a score of 3, four hours of credit are granted. A student who wishes to go further in botany or zoology should consult with his advisor or the appropriate department head about his exact placement in his individual curriculum.

Chemistry. For achievement of a score of 5 or 4, eight hours of credit are granted. The student may not take CHEM 101, 102, 103, 105, 113 or 115 for credit; the student may take any course for which CHEM 113 is a prerequisite. For achievement of a score of 3, four hours of credit are granted. The student may not take CHEM 101, 102, 103, or 105 for credit; he may take any course for which CHEM 103 or 105 is a prerequisite. A student desiring to take additional courses in chemistry should consult with the Chemistry Department concerning his exact placement in a sequence appropriate to his curriculum.

Computer Science. Upon achieving a score of 4 or 5, four hours of credit will be granted. The student may not take CMSC 120 for credit.

English. Upon achieving a score of 4 or 5, irrespective of one's SAT Verbal Score, or a score of 3 plus a SAT Verbal Score of 600 or above, six hours of credit will be granted (three for English 101 and three for English 102). For a score of 3 with a SAT Verbal Score below 600, three hours of credit will be given for English 102, but this *does not* exempt a student from the required English 101. A score of 4 or 5 exempts one from the junior level requirement.

Music Listening and Literature. Upon achieving a score of 3 or better, three hours of credit will be granted. The student may not take MUSC 130 for credit.

Music Theory. Upon achieving a score of 3 *non-music majors only* will be granted 3 credits for MUSC 140. For a score of 4 or better *non majors only* will be granted 6 credits, and may not take MUSC 140 and 141. Upon achieving a score of 4 *music majors only* will receive 3 credits and may not take MUSC 150 for credit. For a score of 5 *music majors only* will receive 6 credits and may not take either MUSC 150 or 151 for credit.

Mathematics. For achievement of a score of 5 or 4 on the calculus BC test, eight hours of credit are granted. The student who wishes to take further mathematics will be placed (usually) in MATH 240 or 241. For achievement of a score of 3, either four or eight hours of credit are granted: four hours to a student placed in MATH 141 and eight hours to a student placed in MATH 240.

For achievement of a score of 5 or 4 in the calculus AB test, four or eight hours credit are granted: four hours to a student placed in MATH 141 and eight hours to a student placed in MATH 250. For achievement of a score of 3, either three or four hours of credit are granted: three hours to a student placed in MATH 221 and four hours to a student placed in MATH 141.

In any case, a student may not take for credit any course of lower level than that of his placement. However, any student given permission to register in MATH 150 may do so without loss of the credit granted him.

Actual placement will follow from a personal interview of each qualifying student with the Chairman, Advanced Placement Committee of the Department of Mathematics.

Physics. Placement in physics is necessarily related to the student's level of mathematical sophistication, consequently, scores on the mathematics test are considered in conjunction with those on the physics test. Specific placement and credit arrangements are:

a. For achievement of a score of 4 or better on the calculus BC test *and* a score of 4 or better on each part of the physics course C test the student may receive credit for courses 161–262 *or* 141–142. For those interested in the physics major sequence 191–192, 293–294, eight credits will be granted and the student will be placed in a course appropriate to his level after consultation with his advisor.

b. For achievement of a score of 4 or better on the calculus BC test, *and* a score of 4 or better only on part I (II) of the physics course C test the student may receive credit for courses 161 (262) or 141 (142). Those interested in the 191–192, 293–294 sequence will receive four credits and

be placed in a course after discussion with their advisors.

c. Three hours of credit will be granted for each part of the physics course C test passed with a score of 3 or better. Six hours of credit will be granted for a score of 4 or better on the physics course B test. In both these cases the granting of credit is independent of the score on the calculus BC test.

d. A student with 3 or 6 advanced placement credits in PHYS 121 or 122, but needing additional credits for the laboratory work should contact the Associate Chairman, Department of Physics, 454–3403.

e. Physics and astronomy majors should consult with their advisors and all others with the advanced placement advisor about how best to use advanced placement and credit.

American History. Students who attain a score of 4 or 5 on the Advanced Placement examination in American history are given six hours of lower-level credit in history; they may not take HIST 156 or 157 for credit, but may take any courses for which these are prerequisites. Students who attain a score of 3 on this examination are given three hours of lower-level credit in history; they may not take *both* HIST 156 and 157 for credit, but may take any courses for which these are prerequisite. Elective credit only.

European History. Students who attain a score of 4 or 5 on the Advanced Placement examination in European history are given six hours of lower-level credit in history; they may not take HIST 130, 131, 132 or 133 for credit, but may take any courses for which these are prerequisite. Students who attain a score of 3 are given three hours of credit; they may not take HIST 130, 131, 132 or 133 but may take any courses for which these are prerequisites. Elective credit only.

Latin. For achievement of a score of 5 or 4 on the Virgil test, six hours of credit are granted, however, only three of these may be applied toward meeting the requirements for a major in Latin. For achievement of a score of 3, three hours of credit are granted. A student receiving credit on the basis of the Advanced Placement examination may not take LATN 305 or any lower numbered courses for credit. A student who wishes to take further work in Latin should register for LATN 351. (No advanced placement credit is given for performance on the comedy, lyric, or prose examination.)

French. For achievement of a score of 3 on the French language examination, three hours of credit are earned. The student may take either FREN 201 or 211 for credit. For achievement of a score of 4 or 5 on the French language examination, six hours of credit are earned. The student may not take FREN 201 or 211 for credit. (Native speakers of French, i.e., those whose language of instruction in elementary school was French may not earn credit by means of this examination.)

For achievement of a score of 3 or better on the French literature examination, three hours of credit are earned. The student may not take more than one of the following for credit: FREN 251, 252. For achievement of a score of 4 or 5 on the French literature examination, six hours of credit are earned. The student may not take FREN 251 or 252 for credit.

Students who wish to continue in French must consult with the Department of French regarding placement.

German. For achievement of a score of 3 or better, six hours of credit are granted. The student may not take GERM 111, 112, 114 or 115 for credit. A student who wishes to continue with German should take GERM 301 or 221.

Spanish. For achievement of a score of 5 or 4 on the Spanish language examination, six hours of credit are granted. If the student wishes to continue in Spanish, he must begin with courses on the 300 level, after consultation with a departmental advisor.

For achievement of a score of 3 on the language examination, three hours of credit are granted. A student who wishes to continue in Spanish must begin with courses on the 200 level.

For achievement of a score of 5 or 4 on the Spanish literature examination, six hours of credit are granted. For a score of 3 on the literature examination, three hours of credit are granted. A student wishing to continue in Spanish literature must take SPAN 221 or higher.

Art. For achievement of a score of 3, three hours of credit are granted for ARTH 100. For a score of 4 or 5, six hours of credit are granted for ARTH 260 and 261.

Transfer Admission Requirements

A student who has attended any institution of higher learning following graduation from high school and attempted nine or more credits must be considered for admission as a transfer student. In calculating eligibility, the University will use the average stated on the transcript by the sending institution. When an applicant has attended more than one institution, a cumulative average for all previous college work attempted will be used. Transfer applicants must be in good academic and disciplinary standing at their previous institutions to be eligible for possible transfer to the College Park Campus.

Where the number of students desiring admission exceeds the number that can be accommodated in a particular professional or specialized program, admission will be based on criteria developed by the University to select the best qualified students.

Requirements

Those Admissible as High School Seniors. Students who are eligible for admission as high school seniors and who are in good academic and disciplinary standing at their previous institutions are eligible to be considered for transfer. Transfer applicants must have a C average in all previous college-level work to be admitted.

Those Not Admissible as High School Seniors. Students who are not admissible as high school seniors must complete at least 28 semester hours with a C or better cumulative average at another institution.

Undergraduate Students Transferring from Within the University System

A student seeking to move from one campus of the University to another must have been a regular degree-seeking student eligible to return to his or her original campus.

Students who were special or non-degree students or undergraduate students who have been academically dismissed by one campus must contact the admissions office of the receiving campus.

Students must comply with the normal deadlines and, where space is limited, admission to the new campus will be based on criteria designed to select the best qualified students.

Transfer Students from Maryland Community Colleges

Currently, Maryland residents who attend Maryland public community colleges may be admitted in accordance with the criteria outlined in the general statement above. The University subscribes to the policies set forth in the Maryland State Board of Higher Education Transfer Policies. Where the number of students desiring admission exceeds the number that can be accommodated in a particular professional or specialized program, admission will be based on criteria developed by the University to select the best qualified students.

Transfer of Credits

General Statement. In general, credit from academic courses taken at institutions of higher education accredited by a Regional Accrediting Association will transfer, provided that the appropriate academic officials at this campus consider such courses part of the student's curricular program and that the student earned at least grades of C in those courses. An academic advisor will discuss this and other matters during the period of registration.

Maryland Public Colleges and Universities. Transfer of coursework completed at Maryland public colleges and universities is covered by the Maryland State Board for Higher Education Transfer Policies.

Community College Articulated Programs. An articulated transfer program is a list of community college courses which best prepare the applicant for a particular course of study at College Park. If the applicant takes appropriate courses which are specified in the articulated program guide, and earns an acceptable grade, he/she is guaranteed transfer with no loss of credit.

Articulated career program guides help students plan their new programs after changing career objectives. The guides are available at the Office of Undergraduate Admissions on the College Park Campus and in the transfer advisor's office at each of the community colleges. If the applicant checks this guide he/she can eliminate all doubt concerning transfer of courses by following a program outlined in the guide.

University of Maryland System. Credits and grades for undergraduate courses will transfer to the College Park Campus from other University of Maryland campuses. The applicability of these courses to the particular program chosen at College Park will be determined by an academic advisor/evaluator in the office of the dean or provost (see section on Orientation Programs, below).

Other Universities and Colleges. Credit will transfer from institutions of higher education accredited by a Regional Accrediting Association (i.e., Middle States Association of Colleges and Schools, New England Association of Schools and Colleges, North Central Association of Colleges and Schools, Northwest Association of Colleges and Schools, Southern Association of Colleges and Schools, Western Association of Colleges and Schools), provided that the course is completed with at least a grade of C and the course is similar in content to work offered at College Park. The applicability of these courses to the particular course of study chosen at College Park will be determined by an academic advisor/evaluator in the office of the appropriate dean or provost.

Foreign Language Credit. Transfer foreign language credit is usually acceptable in meeting requirements. Prospective students should consult the appropriate sections of this catalog to determine the specific requirements of various colleges and curricula.

Advanced Placement Credit. If Advanced Placement credits are already on a student record from an institution outside The University of Maryland System,

the score must be equivalent to a minimum University score or the credit will not be considered for transfer.

State Board for Higher Education Transfer Policies

The University of Maryland fully subscribes to the Maryland State Board for Higher Education Transfer Policies. A complete text of the policy follows.

These Student Transfer Policies, developed by a special task force of the Segmental Advisory Committee, were adopted by the Maryland State Board for Higher Education on November 1, 1979. In view of the Board's sensitivity to the need of the institutions and segment boards to have sufficient lead time to make these policies operational, the new policies shall be effective and applicable to students enrolling in Maryland's public postsecondary education institutions in fall, 1980, and thereafter. At that time they will supersede SBHE student transfer policies in effect since 1972.

Preamble

The major objective of these policies is to relate in operational ways the undergraduate programs offered in the public sector of higher education in Maryland. These policies aim at equal treatment of native and transfer students. The effectiveness of these policies, since their promulgation in December 1972, has been confirmed by the minimal loss of credits experienced by students transferring within the public sector, by the apparent satisfaction of these students, and by the absence of appeals concerning the transferring of credits.

The intended principal beneficiary is the student, who is best served by current information about programs and protected by firm arrangements among the public segments of higher education in Maryland which permit him to plan a total degree program from the outset. With successful academic performance, he or she can make uninterrupted progress even though transfer is involved. The measures of the effectiveness of the plan is maximum transferability of college level credits within the parameters of this agreement. Essentially, transfer and native students are to be governed by the same academic rules and regulations.

In a complementary way the State's interests are served by having its higher education resources used optimally by reducing the time taken to complete a degree through the avoidance of repeated class experience.

The institutional interests are protected also by the systematic approach; institutions are relieved of the uncertainties of unplanned articulation without becoming production line enterprises.

The dynamics of higher education preclude one-and-for-all time curricula and perpetual grading and retention systems. However, within the general structure of this plan there is opportunity for continual updating of the details.

In more specific ways this document's purpose is (1) to recommend specific areas of agreement among the public two-year and four-year institutions of higher education pertaining to facilitating the transfer of students within these segments, (2) to provide for a continuous evaluation and review of programs, policies, procedures, and relationships affecting transfer of students; (3) to recommend such revisions as are needed to promote the academic success and general well-being of the transfer student, and (4) to provide a system for appeals.

Policies

1. Public four-year colleges and universities shall require attainment of an overall 2.0 average on a four-point scale by Maryland resident transfer students as one standard for admission. If the student has attended two or more institutions, the overall 2.0 will be computed on grades received in courses earned at all institutions attended unless the student presents an Associate in Arts degree.
   (a) Each public institution of higher education shall designate a person responsible for coordinating transferability to assist in accomplishing the policies and procedures outlined in this plan. The State Board for Higher Education will support requests by a public institution of higher education to establish the position of transfer coordinator.
   (b) Efforts shall be intensified among the sending institutions, based on shared information, to counsel students on the basis of their likelihood of success in various programs and at various institutions. (See par. 1 (c) and par. 9).
   (c) Procedures for reporting the progress of students who transfer within the State shall be developed as one means of improving the counseling of prospective transfer students.
2. Admission requirements and curriculum prerequisites shall be stated explicitly in institutional publications. Students who enroll at Maryland Community Colleges shall be encouraged to complete the Associate in Arts degree or to complete 56 hours in a planned sequence of courses which relate to general education and the selection of a major before transfer. Subsequent graduation from the receiving four-year institution is not assured within a two-year period of full-time study.
   (a) Students from Maryland Community Colleges who were admissible to the four-year institution as high school seniors and who have attained an overall 2.0 average in college and university parallel courses shall be eligible for transfer at any time, regardless of the number of credits. Those students who have been awarded the Associate in Arts degree or who have successfully completed 56 hours of credit with an overall 2.0 average in either case in college and university parallel courses, shall not be denied transfer to an institution. If the number of students desiring admission exceeds the number that can be accommodated in a particular professional or specialized program or certain circumstances exist which require a limitation being placed on the size of an upper division program or on the total enrollment, admission will be on criteria developed and published by the receiving institution, which provides equal treatment for native and transfer students.
   (b) Course semester hour requirements which students must meet in order to transfer with upper division standing shall be clearly stated by the receiving institution.
   (c) The establishment of articulated programs is required in professional and specialized curricula.
3. Information about transfer students who are capable of honors work or independent study shall be transmitted to the receiving institution.
4. Transfer students from newly established public colleges which are functioning with the approval of the State Board for Higher Education shall be admitted on the same basis as applicants from regionally accredited colleges.
5. (a) Credit earned at any other public institution in Maryland shall be transferable to any other public institution provided:
      (1) the credit is from a college or university parallel program;
      (2) the grades in the block of courses transferred average 2.0 or higher, and
      (3) the acceptance of the credit is consistent with the policies of the receiving institution governing students following the same program.
   (b) Credit for the CLEP general examinations will be considered for transfer only for scores at the 50th percentile, and above, of the combined national men-women sophomore norms. The exact number of credits awarded, if any, in transfer will be determined by the same regulations that pertain to native students in the receiving institution. The percentile needed to transfer credit for the CLEP subject examination will be determined by the receiving institution. Segmental/Institutional governing boards shall submit to the State Board for Higher Education by December 1st of each year data collected from the institutions concerning the credit given, minimum scores and equivalent courses of the CLEP subject examinations. This data will be distributed annually by the State Board for Higher Education to transfer advisors at all institutions. In order to facilitate the transfer of Advanced Placement and CLEP credit, the achievement score for Advanced Placement and the scaled score, percentile rank and the type of examinations (General or Subject) for the CLEP shall be reported on the transcript when credit is awarded.
   (c) The Associate in Arts degree shall serve the equivalent of the lower division general education requirements at the receiving institution where the total number of credits required in the general education program in the sending institution is equal to or more than that required in the receiving institution and where the credits are distributed among the arts and sciences disciplines.
   (d) The determination of the major program requirements for a baccalaureate degree, including courses in the major taken in the lower division, shall be the responsibility of the institution awarding the degree.
6. Transfer of credits from the following areas shall be consistent with the State minimum standards and shall be evaluated by the receiving institution on a course-by-course basis:
   (a) Courses from technical (career) programs.
   (b) Orientation courses.
   (c) Remedial courses.
   (d) Courses credited by a university or college which has no direct academic and administrative control over the students or the faculty involved in the courses.
   (e) Credit for work experiences.
7. Credit earned in or transferred from a community college shall normally be limited to approximately half the baccalaureate degree program requirement, but in no case more than 70 credits, and to the first two years of the undergraduate educational experience.
8. Transfer students shall be given the option of satisfying graduation requirements which were in effect at the receiving institution at the time they enrolled as freshmen at the sending institution, subject to conditions or qualifications which apply to native students.
9. Institutions shall notify each other as soon as possible of impending curricular changes which may affect transferring students. When a change made by one institution necessitates some type of change at another institution, sufficient lead time shall be provided to effect the change with minimum disruption.
10. Community college students are encouraged to choose as early as possible the institution and program into which they expect to transfer.
11. The Segmental Advisory Committee shall continue to review articulation issues and shall recommend policy changes as needed to the State Board for Higher Education.
12. In the event a transfer student believes he or she has not been accorded the consideration presented in this policy statement, the student shall have the opportunity to have the situation explained or reconciled.

Initially, differences of interpretation regarding the award of transfer credit shall be resolved between the student and the institution to which he is transferring. If a difference remains unresolved, the student shall present his/her evaluation of the situation to the institution from which the student is transferring. Representatives from the two institutions shall then have the opportunity to resolve the differences.

The sending institution has the right to present an unresolved case to the Segmental Advisory Committee through a written appeal to the State Board for Higher Education. The SAC shall receive relevant documentation, opinions and interpretations in written form from the sending and receiving institutions and from the student. The Segmental Advisory Committee will send the written documentation to a pre-established articulation committee which, after review, will submit its recommendations to the Segmental Advisory Committee.

Copies of the recommendation shall be forwarded by the State Board for Higher Education to the segments for distribution to the appropriate institutions.

A complaint on transfer status must be initiated by the student within one calendar year of his/her enrollment in the receiving institution.

Special Applicants

Minority Students

In keeping with the University Affirmative Action Program, special consideration will be given to minority students who demonstrate the potential for academic success. Minority students are urged to contact both an admissions counselor and the Office of Minority Student Education.

Returning Students and Veterans

Maryland residents who have not attended school for more than 5 years, or who have had military experience, may find that the published standards for freshman and transfer admissions are not applicable. To discuss educational plans, returning students and veterans should contact both an admissions counselor and the Returning Students Program.

Students returning to the College Park Campus after a separation of five calendar years may petition their appropriate dean or provost to have a number of grades and credits from courses previously taken at College Park removed from the calculation of their cumulative grade point averages and from the credits applied toward graduation requirements. For more information, consult the section on Academic Regulations and Requirements.

International Undergraduate Student Admissions

General Requirements. The University of Maryland values the contribution international students make to the College Park community. Therefore, applications from the international community are welcomed. However, due to the differences between foreign educational systems and education in the United States, international students will face a number of challenges in adapting to study at the University. Students who have received, throughout their secondary school and university level work, marks or examination results considered to be "very good" to "excellent" are those who are most likely to succeed at our institution. Admission for international students is competitive and offered only to those who are considered by the University to be better than average in their own educational setting. Students also have to demonstrate, in their secondary level studies, that they have successfully completed a diversity of subjects representing language, mathematics, physical or biological science and social sciences. Because of the keen competition at The University of Maryland, we suggest applicants apply early.

Those who will hold the following visa types, A, E, F, G, H, I, J, and L, will be admitted on the basis of their academic backgrounds and must present records with marks of "very good" to "excellent." However, non-immigrants, other than F or J visa holders, who have completed four years of U.S. secondary education (grades 9 through 12), will be evaluated on the same basis as U.S. Citizens and Permanent Residents/Immigrants. International applicants who present one full year of acceptable university level credit will be considered for admission as transfer students. Those with less than one full year of acceptable credit must also meet the freshman admission requirements for international applicants.

International students applying for admission to undergraduate programs at The University of Maryland must submit: (1) an application and fee for admission, (2) copies of official secondary school records (including any secondary external examinations, such as the G.C.E. "Ordinary" level examinations, or the Baccalaureat); (3) transcripts of any university level studies completed in the United States or elsewhere. Original documents written in a language other than English must be accompanied by an English translation.

International students who have completed grades 10, 11 and 12 in a U.S. high school must also take the Scholastic Aptitude Test (SAT) and submit the results. All freshman applicants to the College of Engineering, regardless of where they have studied, must present SAT scores. Admission to selective majors (see "Admissions to Selective Majors" on page 33 for identification of these majors) requires international students to have marks of no less than "excellent" in previous education in order to be considered for admission into the selective major.

International students on F-1 Student visas accepted for admission to the University will receive the I-20 form from the Office of International Education Services (IES), this form is needed to secure, transfer, and extend the Student visa after applicants have certified their financial support and submitted evidence of satisfactory English proficiency to the IES Office.

International students accepted for admission will be expected to plan their arrival sufficiently in advance of the registration period to secure housing and attend the special orientation program for international students that is held the week prior to registration.

English Proficiency. All applicants must demonstrate a satisfactory level of English proficiency. Such proficiency is necessary in order to pursue a full course of study at The University of Maryland College Park. All non-native speakers of English must submit a score report from the Test of English as a Foreign Language (TOEFL) during the application process. Non-native speakers who have received a degree from a tertiary level institution in the U.S., English-speaking Canada, United Kingdom, Ireland, Australia, New Zealand, or Commonwealth Caribbean are exempt from the TOEFL requirement. Native speakers of English are defined as those educated entirely in the U.S., English-speaking Canada, United Kingdom, Ireland, Australia, New Zealand, or Commonwealth Caribbean. Applicants who are unsure as to whether or not they need to take the TOEFL should contact the Office of International Education Services. Non-native speakers of English who have graduated from U.S. high schools must submit TOEFL examination results. For information and a TOEFL application brochure, write to: TOEFL, Box 2896, Princeton, N.J. 08540.

Application Deadlines

1. Those applicants who would be studying under F (Student) or J (Exchange Visitor) visas must meet the following deadlines:

   Fall semester—March 1
   Spring semester—August 1

2. Non-Immigrants (A, E, G, H, I, L visas) must have complete applications submitted by the following deadlines (complete applications must include all academic records and transcripts for work completed, and TOEFL scores if the applicant is a non-native speaker of English):

   Fall semester—April 30
   Spring semester—November 1

3. *All applicants* must submit all foreign educational credentials, and certified English translations of such records in languages other than English, at least three months in advance of the first day of classes in order to be given full consideration for admission.

Return of Foreign Records. Transcripts (records, marksheets) of applicants with foreign credentials are maintained by the Office of Undergraduate Admissions for two years. If these documents are original copies, the student must request their return within two years of application. At the end of this period, the records are destroyed.

Immigrant Student Admission

Immigrant applicants for admission at the undergraduate level are admissible under the same guidelines as U.S. citizens EXCEPT that applicants, including transfer applicants, whose native language is other than English must *ALSO* demonstrate a satisfactory level of English proficiency to pursue an approved course of study.

Non-Degree (Special) Student Admission

Applicants who qualify for admission but do not desire to work toward a baccalaureate degree may be admitted as non-degree seeking (special) students.

Special students who have received a baccalaureate degree are advised that no credit earned while enrolled as special students may be applied at a later date to a graduate program. These post-baccalaureate students may enroll in undergraduate courses for which they possess the necessary prerequisites, but may not enroll in courses restricted to graduate students only. Students who wish to take courses at the graduate level (600 and above) must contact the Graduate School for information concerning admission requirements for Advanced Special Student status.

Non-degree seeking (special) students who do not have a baccalaureate degree must submit transcripts and meet regular admission standards. Transcripts are not required from students with baccalaureate degrees.

Because of space limitation, several departments require permission in advance to enroll as a non-degree student. Please contact the Office of Undergraduate Admissions for further information.

Preprofessional Programs and Options

The College Park Campus offers preprofessional advising in Dental Hygiene, Dentistry, Forestry, Law, Medical Technology, Medicine, Nursing, Optometry, Osteopathy, Pharmacy, Physical Therapy, Podiatry, and Veterinary Medicine. This advising will guide the student to the best preparation for advanced study and training in these fields. For additional information, see the section on Campus-wide Programs.

Participation in a preprofessional program on the College Park Campus does not guarantee admission to another branch of the University or to another institution.

The Radiologic Technology program previously offered at The University of Maryland at Baltimore (UMAB) is no longer available. Students choosing the preprofessional program in this field will receive training that should prepare them for transfer to other institutions.

Students who have already earned more than 30 semester hours at another college-level institution, and who seek admission to preprofessional programs in Nursing, Pharmacy, Dental Hygiene, Physical Therapy, Medical Technology, and Forestry, should contact the academic advisor for the preprofessional programs at College Park before filing an application for the College Park Campus. Please address correspondence to the academic advisor of the specific preprofessional program to which the applicant is applying, for example, Advisor for Pre-Nursing Program, 3103 Turner Laboratory, The University of Maryland, College Park, MD 20742.

Golden Identification Card Program

The College Park Campus participates in The University of Maryland's Golden Identification Card Program. The campus will make available courses and various services to persons who are 60 years of age or older, who are residents of the State of Maryland and who are retired (not engaged in gainful employment for more than 20 hours per week); or who are under 60 years of age and are retired and disabled as defined by the Social Security or Railroad Retirement Act. When persons eligible for this Program apply for the Program and receive their Golden Identification Cards, they may register for credit courses as regular or special students in any session. Tuition and most other fees will be waived. The Golden Identification Card will entitle eligible persons to certain academic services, including the use of the libraries, as well as certain other non-academic services. *Such services will be available during any session only to persons who have registered for one or more courses for that session.* Additional information may be obtained from the Office of Undergraduate Admissions.

Admissions to Selective Majors

Certain colleges, schools, and departments within the University have taken steps to limit their enrollment in order to maintain quality programs. These include: School of Architecture, College of Business and Management, College of Engineering, Department of Computer Science, Department of Electrical Engineering, Department of Housing and Design, College of Journalism, Department of Special Education, and all teacher education majors. *Enrollment is competitive, and except for a select number of outstanding freshmen, students must complete a particular set of requirements before admission.*

Students not admitted directly as freshmen may still enroll on the campus as pre-business, pre-computer science, pre-engineering, or other pre-majors. However, admission as a preprofessional student does not guarantee subsequent admission in any of the majors. To assess your chances of being admitted at a later date, contact an academic advisor within the appropriate program.

Selective admissions for the major in radio-television-film have been proposed and may be in effect for fall semester, 1986.

For specific requirements not detailed in the following sections applicants are urged to contact the Office of Undergraduate Admissions.

Architecture

Admission to the School of Architecture is generally limited to students who enroll as juniors.

To be considered for admission, all applicants—whether they are currently enrolled on the College Park campus or transfer students—must submit a portfolio. The portfolio should be organized in an 8½" × 11" loose leaf notebook, and it must demonstrate strong creative ability. In addition, students will be considered for admission only if they have at least a 3.0 grade point average. They should have completed freshman English and appropriate coursework in calculus and physics. Architecture survey and history courses are recommended.

Business and Management

Admission to the College of Business and Management is generally limited to students who enroll as juniors.

To be eligible for admission, all currently enrolled College Park students must meet the minimum grade point average established for the semester during which they anticipate initial enrollment. To date, this competitive grade point average has not been lower than 2.5 and is expected to be higher beginning May 1985. Applicants to the College of Business and Management must have completed 56 semester hours by the time of enrollment. These hours must include six hours of accounting and economics, three hours each of statistics and speech, and nine hours of math.

Computer Science

Admission to the Department of Computer Science is competitive. A small number of academically talented, entering freshmen will be offered admission, however, admission is generally limited to students who have met the following requirements:

a. Successful completion of CMSC 112, CMSC 122, MATH 140 and 141, and
b. Completion of a minimum of 28 college credits, and
c. Achievement of a grade point average which meets the competitive requirements in effect for the semester of anticipated enrollment in the department. While the department has decided that the grade point average will be at least 2.30, it is expected that the actual grade point average required for a given semester will be significantly higher.

A few potentially qualified students who are unable to meet these criteria will be considered on a case-by-case basis by a special committee within the department.

Applicants to the Department of Computer Science, who are eligible for admission to the College Park Campus but who do not meet the department's selective admission requirements, will be offered admission to the University as pre-computer science majors. Designation as a pre-computer science major does not assure eventual admission to the Department of Computer Science.

Because of space limitations, the College Park Campus may not be able to offer admission to all qualified applicants. Interested students are urged to apply early.

Engineering

The College of Engineering admits a larger number of qualified freshmen than the other programs described in this section. Still, enrollment is limited and competition for available openings is stiff, especially in Electrical Engineering. All applications will be reviewed on a *space-available* basis.

Freshmen will be considered on the basis of their academic grade point average and SAT score. Particular emphasis is placed on the mathematics section of the SAT. The requirements for direct admission to Electrical Engineering are more stringent than for other engineering majors.

All transfer students, as well as students presently enrolled on the College Park Campus, must meet the competitive grade point average (currently 3.0) in effect for the semester during which the student anticipates initial enrollment. In addition, applicants must have completed at least 28 semester hours including eight hours each of calculus and chemistry and three hours of physics. Engineering science and statics are also strongly recommended.

Transfer students who wish to major in Electrical Engineering will encounter additional course requirements. Prospective applicants to this major should contact the Office of Undergraduate Admissions (301–454–4009) or the Student Affairs Office in the College of Engineering (301–454–2421) for details.

Housing and Design

Admission to the programs of Interior Design and Advertising Design is competitive. A small number of academically talented, entering freshmen will be admitted to these programs. To be admitted, a freshman must have a 3.00 high school grade point average *and* a combined SAT score of 1200 or above, or be a National Merit and National Achievement Scholarship finalist or semifinalist, or be a recipient of a Chancellor's Scholarship, Benjamin Banneker Scholarship, or a Maryland Distinguished Scholar Award.

Admission to these programs is generally limited to students who will enroll at the sophomore level and who have met the following requirements:

a. Completion of a minimum of 29 college credits, and
b. Successful completion of four required courses (APDS 101A, APDS 102, APDS 103 and EDIT 160), and
c. Submission of a Design Work Portfolio for review. Students with a grade of B or higher in each of the four required courses are exempt from the portfolio requirement.

All transfer students must submit a Design Work Portfolio. The portfolio may be submitted to the department at the time of application for admission to the University or later, but no later than the application deadline set by the department.

Potentially talented students who are unable to meet the above criteria may be admitted after special review by the department.

Eligible applicants who do not meet the selective admissions requirements for the programs of interior design and advertising design will be offered admission as pre-design majors. While this designation does not assure eventual admission to the design major, pre-design students will be given preferential treatment when registering for departmental courses in which there is an enrollment limitation.

Journalism

Admission to the College of Journalism is competitive, and generally limited to students who enroll as sophomores. A small number of academically talented freshmen will be admitted directly into the College if they have a 3.00 cumulative grade point average in high school academic subjects *and* a combined SAT score of at least 1200. Students will also be admitted to the College if they are National Merit finalists and semi-finalists, National Achievement finalists and semi-finalists, Chancellor's Scholars, Banneker Scholars, or Maryland Distinguished Scholars.

To qualify for provisional admission to the major, students must

a. complete at least 28 credits and achieve a cumulative grade point average which meets the competitive requirements in effect for the semester of anticipated enrollment in the College. While the College has decided that the grade point average will be at least 2.30, it is expected the actual grade point average required for a given semester will be significantly higher.
b. complete ENGL 101 or its equivalent with at least a grade of C (unless students have exempted ENGL 101), and
c. complete satisfactorily a standardized test of language proficiency and demonstrate a typing ability of at least 30 words per minute.

To qualify for full admission to the major, students must

a. complete JOUR 201 with a grade of C or better and
b. maintain at least the same cumulative grade point average required when they received provisional admission.

Students whose applications for provisional or full admission have been rejected may appeal in writing to a faculty committee within the College of Journalism. The same committee will also consider, on a case-by-case basis, applications from a few potentially qualified students who do not meet the above criteria but who show other evidence of ability.

Transfer students will be treated in the same way as native students. However, if they have completed the equivalent of JOUR 201 at an institution not included by ACEJMC a special proficiency exam will be required for admission to the major.

Special Education

Admission to the Department of Special Education is generally limited to students who enroll as sophomores.

To be eligible for admission, currently enrolled College Park students must have a 2.0 grade point average and have completed approximately 30 credit hours, including the following: introductory psychology, sociology, statistics, mathematics, hearing and speech sciences, and six hours of specified education courses. A grade of C in EDSP 210 is required.

Applicants must submit an application specific for the selective admissions program and each will be reviewed on the basis of academic record, experiences with handicapped persons, and the appropriateness and clarity of a professional goal statement. An appeals process has been established for students who do not meet the competitive grade point average for admission but who are applying in connection with special University programs such as affirmative action or selection for academic promise.

Transfer students from Maryland community colleges or Northern Virginia Community College should contact their transfer coordinator for specific information. All other students should contact the Department of Special Education.

Teacher Education

Pre-education majors apply for admission to teacher education through The University of Maryland College Park (UMCP) Office of Undergraduate Admissions (OUA) upon the completion of 45 semester hours of credit. Transfer students with 45 or more semester hours of acceptable credit must apply at time of transfer. Post-graduate certification students must apply at the beginning of their program. Application forms may be obtained from the OUA.

For admission into a teacher education program, a student must (1) complete the USP Fundamental Studies requirements (6 credits), (2) earn 45 semester hours with an overall cumulative grade point average of at least 2.5 on a 4.0 scale (granted by UMCP or other institution) in all coursework prior to enrollment in EDHD 300, and (3) have satisfactory scores on the language and mathematics segments of the California Achievement Test Level 20. Individuals who do not initially meet the criteria for admission to teacher education will be given an additional semester in which to become eligible. During that semester the student will follow a plan for attaining eligibility developed by the student and the department advisor.

Application Procedures

Application Forms. Application forms may be obtained by writing to: Office of Undergraduate Admissions, North Administration Building, University of Maryland, College Park, MD 20742. Application forms are also available in high school guidance offices and college counseling centers.

All applicants must comply fully with the directions printed on the application form. Incomplete forms cannot be processed.

Application Fee. A non-refundable $20.00 application fee is required with each application.

Application Deadlines

The College Park Campus strongly urges that all applicants apply early. Stated deadlines assure *consideration* for admission. The campus must reserve the right to change deadlines without notice. Because of space limitations, the campus may not be able to offer admission to all qualified applicants.

For each term, applications will be processed on a space-available basis. The campus, however, reserves the right to return applications received after the announced deadline for each term.

Fall 1986 Matriculation

July 30, 1986—Transfer applicants' deadline for submission of applications and all other required documents.

Spring 1987 Matriculation

December 15, 1986—Undergraduate applicants' deadline for receipt of applications and all other documents.

Fall 1987 Matriculation

December 1, 1986—Applications, transcripts, and SAT results (freshmen only) must be received for freshman and transfer students who are eligible for admission and who wish to receive first consideration for housing within their own priority group for Fall, 1987. *

February 1, 1987—Architecture applicants must apply by this date to be assured of consideration.

April 30, 1987—Estimated freshman applicants' deadline for receipt of applications and all other required documents. Please note: space may not be available to accommodate all qualified freshmen who apply by this date.

July 30, 1987—Transfer applicants' deadline for submission of applications and all other required documents.

* Transfer applicants who are enrolled as *first semester freshmen* during the Fall 1986 semester (enrolled in a college or university for the first time) are eligible to receive first consideration for housing within their own priority group if: (1) the application and high school transcript are received in the Office of Undergraduate Admissions by December 1, 1986 and (2) the applicant's college or university transcript reflecting Fall 1986 grades is received in this office by January 1, 1987.

Determination of In-State Status for Admission, Tuition, and Charge Differential Purposes

An initial determination of in-state status for admission, tuition and charge-differential purposes will be made by the University at the time a student's application for admission is under consideration. The determination made at that time, and any determination made thereafter shall prevail in each semester until the determination is successfully challenged. Students may challenge their classification by submitting a *petition*. Petitions are available in the Office of Undergraduate Admissions. *The deadline for meeting all requirements for in-state status and for submitting all documents for reclassification is the last day of late registration for the semester if the student wishes to be classified as an in-state student.*

The volume of requests for reclassification may necessitate a delay in completing the review process. It is hoped that a decision in each case will be made within ninety (90) days of receipt of a request for redetermination and all necessary documentation. During this period of time, or any further period of time required by the University, fees and charges based on the previous determination must be paid. If the determination is changed, any excess fees and charges will be refunded.

Petitions, related documents and questions concerning the policy of The University of Maryland for the determination of in-state status should be directed to the Office of Undergraduate Admissions, North Administration Building, The University of Maryland, College Park, MD 20742, Phone (301) 454–4137.

Students Classified as In-State for Admission, Tuition and Charge-Differential Purposes. Students classified as in-state for admission, tuition and charge-differential purposes are responsible for notifying the Office of Undergraduate Admissions in writing within 15 days of any change in their circumstances which might in any way affect their classification at the College Park Campus.

The written notice of change in circumstances or questions concerning the policy of The University of Maryland for the determination of in-state status should be directed to Office of Undergraduate Admissions, Ground Floor, North Administration Building.

Graduate Student Admission

In certain circumstances, a senior may register for graduate courses For information, consult the regulations concerning "Concurrent Undergraduate-Graduate Registration," under Academic Regulations and Requirements

Admission to graduate study at The University of Maryland is the responsibility of The Graduate School College Park Requests for information about graduate programs or correspondence concerning application for admission to The Graduate School, College Park should be addressed to the Admissions Office, The University of Maryland Graduate School, South Administration Building College Park, MD 20742

Orientation Programs

Upon final admission to the University the new student will receive materials about the Orientation and Registration Program This program is offered by the Office of Student Affairs, and all entering students are encouraged to attend The primary goals of the program are to inform the student about the University and to help the student register for the first semester Through this program the entering student receives a personalized and individual introduction to the University plus individual advising about course selection for the first semester During this Orientation Program, new students register for courses for their initial semester on campus.

Parents also have an opportunity to learn about University life through the Parent Orientation Program More information about this program may be found under "Orientation," elsewhere in this catalog

For more information, contact the Orientation Office, 1195 Stamp Union, telephone (301) 454–5752

Fees & Expenses

Charges incurred during a semester are payable immediately Returning students will not be permitted to complete registration until all financial obligations to the University including library fines, parking violations, and other penalty fees and service charges are paid in full

The University of Maryland does not have a deferred payment plan. Payment for past due balances and current semester fees are due on or before the first day of classes. Students who register in advance must pay their bills in full prior to the general registration period Students who register after the initial registration period are required to make full payment by the close of business the following working day to avoid cancellation of their enrollment and loss of their classroom seats to other students.

It is the policy of the University not to defer payment on the basis of a pending application for financial assistance to an outside agency, including Veterans Administration benefits, bank loans, guaranteed student loan programs, etc.

Although the University regularly mails bills to students, it *cannot* assume responsibility for their receipt. If a student bill is not received on or before the beginning of each semester, it is the student's responsibility to obtain a copy of the bill at Room 1103, South Administration Building, between the hours of 8 30 a m and 4 15 p m , Monday through Friday

All checks or money orders should be made payable to the University of Maryland for the exact amount due *Student name and student Social Security number should be written on the front side of the check.* University grant, scholarship, or workship awards, will be deducted on the first bill, mailed approximately one month after the start of the semester However, the first bill mailed prior to the beginning of each semester may not include these deductions.

Students will be severed from University services for delinquent indebtedness to the University In the event that severance occurs, the individual may make payment during the semester in which services were severed and all services except housing will be restored. *A $25.00 severance fee* will be assessed in addition to payment for the total past due amount.

Students removed from housing because of delinquent indebtedness will be required to reapply for housing after they have satisfied their financial obligation Students who are severed from University services and who fail to pay the indebtedness during the semester in which severance occurs will be ineligible to preregister for subsequent semesters until the debt and the $25 00 severance fee are cleared.

In the event of actual registration for a subsequent semester by a severed student who has not settled his student account prior to that semester, such registration will be cancelled and no credit will be earned for the semester

The State has established, under legislative mandate, a Central Collections Unit within the Department of Budget and Fiscal Planning The University is required by State Law to refer all delinquent accounts to the State Collections Unit Please note that changes in Maryland law allow the Central Collections Unit to intercept state income tax refunds for individuals with delinquent accounts

All Accounts Due from Students, Faculty, Staff, Non-Students, etc., are included within these Guidelines

Collection costs incurred in collecting delinquent accounts will be charged to the student. The minimum collection fee is 15% plus attorney and/or court costs

No degree, grades, diploma, certificate, or transcript of record will be issued to a student who has not made satisfactory settlement of his or her account

An Important Fee Notice. Although changes in fees and charges ordinarily will be announced in advance, the University reserves the right to make such changes without prior announcement

NOTE: Additional Information on Student Financial Obligations, Disclosure of Information, Delinquent Accounts, and Special Fees, can be found on page 7

A. Undergraduate Fees

1. Full-time Undergraduate Students 1986–87 Academic Year

a Maryland Residents

	Total Academic Year Cost
Tuition	$1344 00
Registration Fee	10 00
Mandatory Fees (see Explanation of Fees below)	247 00
Board Contract (FY 85–86) *	
1) All 19 meals a week plan	$1578 00
2) Any 15 meals a week plan	1471 00
3) Any 10 meals a week plan	1400 00
Lodging (FY 85–86) *	$1842 00

b Residents of the District of Columbia, other states, and other countries.

	Total Academic Year Cost
Tuition	$4220 00
Registration Fee	10 00
Mandatory Fees (see Explanation of Fees below)	247 00
Board Contract (FY 85–86) *	
1) All 19 meals a week plan	$1578 00
2) Any 15 meals a week plan	1471 00
3) Any 10 meals a week plan	1400 00
Lodging (FY 85–86) *	$1842 00

* Increases in board and lodging for 1986–87 are under consideration by the Board of Regents at the time of this printing

2. Fees for Part-Time Undergraduate Students

Tuition (per credit hour)	$77 00
Registration Fee (per semester)	5 00
Mandatory Fees (per semester)	49 50

Note: The term "part-time undergraduate student" is interpreted to mean an undergraduate student taking 8 semester credit hours or less Students carrying 9 semester hours or more are considered to be full-time and must pay the regular full-time fees.

B. Graduate Fees

1 Maryland Residents (fee per credit hour)	$92 00
2 Residents of the District of Columbia, other states and other countries (fee per credit hour)	163 00
3 Registration Fee (per semester)	5 00
4 Mandatory Fees (per semester):	
Full-time (9 or more credit hours per semester)	73 50
Part-time (8 or less credit hours per semester)	44 50

Explanation of Fees

Mandatory Fees

The Registration Fee (Non-Refundable): The Registration Fee is charged to all registrants each semester.

The Instructional Materials Fee (Refundable): Charged to all students for instructional materials and/or laboratory supplies furnished to students

The Student Activities Fee (Refundable): Charged to all undergraduate students at the request of the Student Government Association It is used in sponsoring various student activities, student publications, and cultural programs

The Auxiliary Facilities Fee (Refundable): Charged to all students This fee is paid into a fund which is used for capital improvement, expansion and construction of various campus facilities such as open recreation areas (tennis courts, basketball courts, etc), transportation alternatives (shuttle buses), and the Stamp Union These capital projects are not funded or are funded only in part from other sources.

The Athletic Fee (Non-Refundable): Charged to all students for the support of the Department of Intercollegiate Athletics. All students are encouraged to participate in all of the activities of this department, or to attend the contests if they do not participate.

The Student Health Fee (Non-Refundable): Charged to all students for the support of the Health Service facility.

The Shuttle Bus Fee (Non-Refundable): Charged to all students for the support of the Shuttle Bus transportation system.

The Stamp Union and Recreational Fee (Non-Refundable): Charged to all students and is used to expand recreational facilities and Stamp Union services.

Other Fees

Payment of Fees: All checks, money orders, or postal notes should be made payable to the University of Maryland. *The student's social security number must be written on the front of the check.*

The Application Fee (Non-Refundable): $20.00. Charged to all new undergraduate students. Applicants who have previously enrolled at any campus of The University of Maryland including University College at College Park, Baltimore, or off-campus centers are not required to pay this fee.

Pre-College Orientation Program Registration Fee:
$60.00 (two day program)
$39.00 (one day program)
$16.00 (one parent)/$32.00 (two parents)

Late Registration Fee: $20.00. All students are expected to complete their registration including the filing of Schedule Adjustment Forms on the regular registration days. Those who do not complete their registration during the prescribed days must pay this fee.

Special Fee for students requiring additional preparation in mathematics (MATH 001) per semester: $110.00. (Required of students whose curriculum calls for MATH 110 or 115 and who fail in qualifying examination for these courses). This Special Math Fee is in addition to course charge. Students enrolled in this course and concurrently enrolled for 6 or more credit hours will be considered as full-time students for purposes of assessing fees. Students taking only MATH 001 pay for 3 credits plus $110. A 3-credit course plus MATH 001 results in a charge for 6 credits plus $110. A full-time student pays full-time fees plus $110.

Special Fee for students requiring additional preparation in chemistry (CHEM 001) per semester: $70.00. CHEM 001 is recommended for students who do not qualify for MATH 110 or higher, or who have no high school chemistry and must take CHEM 103. This course does not carry credit towards any degree at the University. This Special Chemistry Fee is in addition to course charge.

Cooperative Education Program in Liberal Arts and Business (CO-OP 208-209): $30.00 each.

Engineering COOP Program (ENCO 408–409): $30.00 each.

Fees for Auditors and courses taken for audit are the same as those charged for courses taken for credit at both the undergraduate and graduate levels. Audited credit hours will be added to hours taken for credit to determine full-time or part-time status for fee assessment purposes. Special Students are assessed fees in accordance with the schedule for the comparable undergraduate or graduate classification.

Change of Registration Fee: $2.00 for each course dropped or added after the schedule adjustment period. A **$4.00** fee is charged for each section change ($2.00 for the section added, $2.00 for the section dropped) after the schedule adjustment period.

Graduation Fee for Bachelor's Degree: $15.00

Transcript of Record Fee: $2.00 each copy.

Special Examination Fee: $30.00 per course for all undergraduates and full-time graduate students, credit-hour charge for part-time graduate students.

Vehicle Registration Fees: Vehicles must be registered each academic year by all students enrolled for classes on the College Park Campus and who drive or park a vehicle *anywhere or anytime* on the campus. For additional information, please refer to Motor Vehicle Administration, Administrative Offices Section, Office of Student Affairs.

Textbooks and Supplies: Textbooks and classroom supplies vary with the course pursued, but will average $160.00 per semester.

Service Charges for Dishonored Checks: Payable for each check which is returned unpaid by the drawee bank on initial presentation because of insufficient funds, payment stopped, post-dating, drawn against uncollected items, etc.

For checks up to $50.00 $5.00
For checks from $50.01 to $100.00 $10.00
For checks over $100.00 $20.00

When a check is returned unpaid, the student must redeem the check and pay any outstanding balance in the account within 10 days or all University services may be severed and the account transferred to the State Central Collection Unit for legal follow-up. Additionally, a minimum 15% collection charge is added to the charges posted to the student's account at the time the transfer is made. When a check is returned unpaid due to an error made by the student's bank, the student must obtain a letter from the branch manager of the bank or a person of equivalent status admitting the error. This letter must be submitted to the Office of the Bursar to have the service charged waived.

Library Charges: Fine for failure to return a book from General Library before expiration of loan period—$.35 per day. Fine for failure to return book from Reserve Shelf before expiration of loan period—first hour overdue on first day: $1.00; after first hour on first day: $.50 per hour for each hour open up to a maximum of $30.00 per item. In case of loss or mutilation of a book, satisfactory restitution must be made.

Maryland English Institute Fee: Semi-Intensive, $928.00 (Fall) $976.00 (Spring); Intensive, $1,856.00 (Fall) $1,936.00 (Spring): Students enrolled with the Maryland English Institute pay this fee in support of the Institute. Students enrolled in the semi-intensive program may also enroll for regular academic courses and pay the tuition and fees associated with those offerings. The program also offers non-credit courses: English Pronunciation, $175.00, and Workshop for Foreign Teaching Assistants, $165.00.

Property Damage Charge: Students will be charged for damage to property or equipment. Where responsibility for the damage can be fixed, the individual student will be billed for it; where responsibility cannot be fixed, the cost of repairing the damage or replacing equipment will be prorated among the individuals involved.

Severance of Services Fee: $25.00. Students who fail to pay the balance due on their accounts will have their University services severed and will be required to pay the total amount due plus a $25.00 severance fee.

Withdrawal or Refund Fees: Any student compelled to leave the University at any time during the academic year should secure a form for withdrawal from the Records and Registrations Office. The completed form and the semester Identification/Registration Card are to be submitted to the Records and Registrations Office. The student will forfeit his or her right to refund if the withdrawal action described above is not adhered to. The effective date used in computing refunds is the date the withdrawal form is filed in the Records and Registrations Office. Stop Payment on a check, failure to pay the semester bill, failure to attend classes, does not constitute withdrawal. A request for a refund must be processed by the student with the Office of the Bursar, otherwise any credit on the student account will automatically be carried over to the next semester.

Cancellation of Registration—Submitted to the Withdrawal/Reenrollment Office before the official first day of classes entitles the student to a full credit of semester tuition.

Undergraduate students withdrawing from the University will be credited for tuition in accordance with the following schedule:

Prior to Classes beginning	100%
After Classes begin:	
Between one and two weeks	80%
Between two and three weeks	60%
Between three and four weeks	40%
Between four and five weeks	20%
Over five weeks	No Refund

Prior to the first day of classes, if a full-time undergraduate student drops a course or courses, thereby changing the total number of credits for which the student is reregistered to eight or less, charges for the semester will be assessed on the basis of the per credit hour fee for part-time students. However, if the student later adds a course or courses thereby changing the total number of credits for which the student is registered to nine or more, the student will be billed for the difference between per credit hour fees paid and the general fees for full-time undergraduates.

If during the **first five days of classes** a full-time undergraduate drops a course or courses thereby changing the total number of credits for which he/she is registered to eight or less, charges for the semester will be assessed on the basis of part-time charges plus 20% of the difference between the full-time fees and appropriate part-time charges. After the first five days of classes, there is no refund for changing from full-time to part-time status.

A student who registers as a part-time undergraduate student and *applies* for a refund for courses dropped during the first week of classes will be given a refund. No refund will be made for courses dropped thereafter.

No part of the charges for room and board is refundable except when the student officially withdraws from the University or when he or she is given permission by the appropriate officials of the University to move from the residence halls and/or to discontinue dining hall privileges, in these cases, the

room refund will be computed by multiplying the number of periods remaining times the pro rata weekly rate after adjusting for a service charge. Refunds to students having full board contracts will be calculated in a similar manner. No room and/or board refunds will be made after the fourteenth week of the semester.

In computing refunds to students who have received the benefit of scholarships and loans from University funds, the computation will be made to return the maximum amount to the scholarship and loan accounts without loss to the University.

Financial Aid

The Office of Student Financial Aid provides advice and assistance in the formulation of student financial plans and, in cooperation with other University offices, participates in the awarding of scholarships and grants to deserving students. Scholarships, grants, loans and work-study positions are awarded on the basis of academic ability and financial need. It is the intent of the Committee on Financial Aid to make awards to those qualified students who might not otherwise be able to pursue college studies. Part-time employment opportunities on campus are open to all students, but are dependent upon the availability of jobs and the student's particular skills and abilities.

Additional information is available from the Director, Office of Student Financial Aid, Room 2130, North Administration Building, The University of Maryland, College Park, MD 20742, telephone: (301) 454–3046.

Academic Requirements For Eligibility

The federally appropriated programs require that students make "academic progress" toward a degree or diploma. Any student enrolled in a degree, certificate, or diploma program is considered to be making satisfactory progress for the purpose of the receipt of financial aid at the College Park Campus, with the following restrictions.

Withdrawals. A student who withdraws from the University within the first two weeks of classes must repay to The University of Maryland all financial aid received. If the withdrawal occurs after this period, a prorated share of the aid must be repaid after arrangements are made with the Office of Student Financial Aid.

A student receiving financial aid who has withdrawn prior to the completion of the semester on two occasions will forfeit eligibility for assistance for the semester following the second withdrawal. Eligibility will be reconsidered when the student either 1) has completed a course load equivalent to that of the semester from which he/she withdrew and for which aid was received or 2) documents the circumstances which necessitated the withdrawal, with support from such people as a physician, mental health professional, academic counselor, or religious or community leader.

Extended Graduation Dates. An Undergraduate who does not complete his/her program within the prescribed 4 or 5 year period, and who has received 4 or 5 years, respectively, of financial aid from any school, will be considered for an additional year of loan and/or employment assistance only. An exception to this is the Pell Grant, which is available beyond four years. Since a student may exhaust eligibility for certain financial aid programs within four years, the student is advised to maintain course loads which will insure graduation within the appropriate time. Normally the student should average 15 credits per semester.

A student who is awarded a scholarship and/or grant from the University *must enroll for and maintain* at least 12 semester hours. Any student who is contemplating dropping below 12 hours should contact this Office immediately, since the aid is subject to cancellation at that point. An undergraduate who enrolls for less than 6 credit hours will not be awarded any form of financial aid; a graduate student seeking consideration must be enrolled for a minimum of 24 academic units per semester.

Scholarships and Grants

Most scholarships and grants are awarded to students before they enter the University. However, students who have completed one or more semesters, and have not received such an award, are eligible to apply. Each applicant will receive consideration for all scholarships and grants administered by this office, for which he or she is eligible. Students must submit an application by February 15, including all supporting documents, in order to be considered for scholarship assistance for the ensuing year. Award Letters are normally mailed by May 1 to on-time applicants.

Regulations and procedures for the awarding of scholarships and grants are formulated by the Committee on Financial Aid. All recipients are subject to the academic and non-academic regulations and requirements of the University.

The Committee reserves the right to review the scholarship program annually and to make adjustments in the amounts and the recipients of the awards in accordance with the funds available and the scholastic achievement of the recipients.

Interest in any award that is recommended by a college or school/department should be directed to the Chairperson, Dean, or Department Head of the relevant college, school, or department.

Supplemental Educational Opportunity Grants. Under the provisions of the Educational Amendments of 1980, grants are available to students who demonstrate financial need to continue their post secondary education. A recipient must be a United States citizen, or permanent resident, or a recognized refugee or parolee and enrolled as a full time undergraduate. Annual awards may not exceed $2,000. Eligible students may receive SEOG's only for their first undergraduate degree.

Pell Grant (Basic Educational Opportunity Grant). The federal government provides grant assistance to approved students who need it to attend post secondary institutions. Eligible students may receive annual Pell Grants for the first undergraduate degree or certificate only. An eligible student must enroll for at least 6 credit hours each semester a Pell award is received.

Maryland State Scholarships. The General Assembly of Maryland has created several programs of scholarships for Maryland residents who need financial help to obtain a college education. The undergraduate programs are (1) General State scholarships, (2) Senatorial scholarships, and (3) House of Delegates scholarships. Students wishing to apply for these scholarships should contact their guidance counselor if a high-school senior or the Office of Student Financial Aid if presently attending The University of Maryland. Students who are entering college for the first time must take the Scholastic Aptitude Test in November or December of their senior year. The test is not required of college students who have completed at least 24 semester hours. A Maryland State Financial Aid Form must be mailed to the College Scholarship Service in Princeton, N.J., by February 15 for the upcoming academic year. The deadline for applying for these scholarships is March 1 each year. For additional information, contact the Maryland State Scholarship Board, 2100 Guilford Avenue, Baltimore, Maryland 21218.

Local and National Scholarships. In addition to the scholarships provided by The University of Maryland, a student should give careful consideration to scholarship aid provided by local and national scholarship programs. The University maintains a database of these scholarships and will perform a Scholarship Search for students. Contact OSFA for details.

Endowed and Annual Scholarships and Grants

Interest in a particular award which is recommended by a school, college or department should be directed to the relevant Dean or Chairperson.

Advertising Association of Baltimore Work Experience Scholarship. This award is available to an outstanding sophomore or junior interested in an advertising career. The scholarship includes a summer internship and a $1,000 stipend.

AFROTC College Scholarship Program. Four-year AFROTC scholarships are available to incoming freshmen who qualify. One thousand scholarships are awarded annually to qualified freshmen on a nationwide basis. Application for the four-year scholarship is normally accomplished during the senior year of high school. The AFROTC program also provides two-year and three-year scholarships for selected cadets in the AFROTC program. Those selected receive money for full tuition, laboratory expenses, incidental fees, and an allowance for books during the period of the scholarship. In addition, they receive nontaxable pay of $100 per month. Any student accepted by The University of Maryland may apply for these scholarships. AFROTC membership is required if one receives an AFROTC scholarship.

Agricultural Development Foundation. A number of awards are made to agricultural students from a fund contributed by donors for general agricultural development. Recipients are chosen by the Dean of the College of Agriculture.

Arthur M. Ahalt Memorial Scholarship. A scholarship award is made annually to an undergraduate or graduate student majoring in agricultural education. Recipients are chosen by the Dean of the College of Agriculture.

Air Force Warrant Officers Association Student Aid Program. Scholarship aid has been made available by the Air Force Warrant Officers Association for worthy male or female undergraduate or graduate students in good standing, with preference given to children of Air Force Warrant Officers or other military personnel.

Albright Scholarship. The Victor E. Albright Scholarship is a four-year scholarship open to graduates of Garrett County high schools who were born and reared in that county.

ALCOA Foundation Scholarships Awards of $750 are given to outstanding students majoring in mechanical engineering, civil engineering, electrical engineering and fire protection engineering.

Louis Allen Memorial Scholarship. An annual $500 grant to an undergraduate or graduate student interested in meteorology and weather forecasting. The awardee will be expected to become involved in the weather observing, forecasting and display activities of the Department of Meteorology.

Alumni Scholarships. A limited number of scholarships are made possible through the gifts of alumni and friends to the Alumni Annual Giving Program of the Office of Endowment and Gifts.

Alumni Band Scholarship. A limited number of awards to freshmen are sponsored by The University of Maryland Band Alumni Organization. Recipients are recommended by the Music Department after a competitive audition held in the spring.

American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. This scholarship is awarded to outstanding students majoring in mechanical engineering. A preference is given to students from Baltimore. Recipients are selected by the Department of Mechanical Engineering.

American Society of Agricultural Engineering. Scholarships are awarded to agricultural engineering majors with good scholarship and leadership qualities. Selection of recipients is by the Department of Agricultural Engineering.

Mildred L. Anglin Scholarship. This scholarship is made available from an endowed fund sponsored by the Riverdale Elementary School Parents and Teachers Association in honor of Mrs. Anglin who served that school with distinction for forty years as a teacher and administrator. To be eligible, send a letter to the Student Financial Aid Office indicating attendance at Riverdale Elementary School.

Alvin L. Aubinoe Student Aid Program. Scholarship grants up to $500 per school year to students in engineering, preferably those studying for careers in civil engineering, architecture or light construction. Recipients are chosen by the Dean of the College of Engineering.

Dr. Robert W. Baker Memorial Scholarship. A $500 scholarship is awarded annually by the Professional Grounds Management Society to a student entering the final year at The University of Maryland in Ornamental Horticulture and who the faculty feels intends to follow a career in the "Green Industry".

Baltimore Sunpapers Scholarship in Journalism. The Board of Trustees of the A. S. Abell Foundation, Inc., contributes funds to provide one or more $500 scholarships to students majoring in editorial journalism. Recipients are chosen by the College of Journalism.

Benjamin Banneker Scholarship. Merit awards are available to academically talented minority students, especially Blacks. These awards, renewable for up to four years of undergraduate study, provide funds to cover full-time, in-state tuition and fees. December 1 is the deadline for receipt of both the application for admission to the University as well as the nomination for this award. Automatic consideration is given to all National Achievement Finalists and Semi-Finalists.

Dr. H.C. Byrd Memorial Fund. An endowed fund has been established by the many friends of "Curley" in memory of his many years of outstanding service to the University. His period of service lasted from 1905 when he enrolled as a freshman from Cristfield, until 1954 when he retired after serving as President of the University for 19 years. Prior to that he had served 19 years as head football coach with a record of 109–37–7. Income from the fund will be used to provide financial assistance to deserving student athletes.

Capitol Milk Producers Cooperative, Inc., Scholarship. A scholarship of $750 is awarded annually in the College of Agriculture, preferably to a student preparing for a career in the dairy industry.

Chancellor's Scholars Program. Scholarships, renewable for four years of undergraduate study, are awarded on the basis of merit. The awardees are known as Chancellor's Scholars. The awards provide funds to cover full-time, in-state tuition and fees, and Chancellor's Scholars receive preferential housing and other prerequisites. Recipients are designated by the Chancellor upon the recommendation by a Committee which screens nominations submitted by high school guidance counselors and administrators of the University. For consideration, applicants must be admitted to the University and nominated for this award by December 1. Automatic consideration is given to all National Merit Finalists and Semi-Finalists, all Distinguished Scholar Finalists, Semi-Finalists, and Honorable Mentions.

Dr. Ernest N. Cory Scholarship. This award is made annually to an outstanding junior or senior recommended by the College of Agriculture, preferably one majoring in entomology.

Ernest T. Cullen Memorial Scholarship. A scholarship award is made annually to a deserving student in the College of Agriculture from a high school on the Eastern Shore of Maryland.

Dairy Technology Scholarship and Grants. The Dairy Technology Society of Maryland and the District of Columbia provides a limited number of scholarships and grants-in-aid for students majoring in dairy products technology.

Dairymen, Inc. Scholarship. To students pursuing a degree in dairy production, dairy manufacturing or agricultural economics. Available only to Maryland residents who are sons, daughters, grandsons, or granddaughters of members of Dairymen, Inc.

Delaware-Maryland Plant Food Association Scholarship. A $200 annual award is made to a newly admitted undergraduate who has an interest in agronomy and soil fertility work.

Delmarva Corn and Soybean Scholarship. A $500 scholarship awarded each semester to a junior from the Delmarva Peninsula (who is a U.S. citizen) enrolled in the College of Agriculture. Final selection is by the Delmarva Corn and Soybean Conference.

Delta Nu Alpha Fraternity Chesapeake Chapter—No. 23, Traffic and Transportation Award. An award of $400 to an outstanding senior member of The University of Maryland chapter majoring in transportation in the College of Business and Management.

Mylo S. Downey Memorial Scholarship. Awarded to a student in the College of Agriculture with preference to those with successful achievement in 4-H Club work and financial need.

James R. Ferguson Memorial Fund. Scholarship awards are made annually to incoming freshmen, enrolled in animal sciences, on the basis of academic achievement and financial need.

Anne Arundel County Volunteer Firemen's Association Grant. This tuition and fees grant is awarded to a high school graduate who will enroll in the fire protection curriculum in the College of Engineering. The award is normally for four years.

Baltimore County Volunteer Firemen's Association Grant. This tuition and fees grant is awarded to a student who will enroll in the fire protection curriculum in the College of Engineering. This award is normally for four years.

Ladies Auxiliary to The Maryland State Firemen's Association Grant. This $750 grant is awarded to an outstanding high school graduate who will enroll in the fire protection curriculum in the College of Engineering. The award is normally available for four years.

Maryland State Firemen's Association Grant. A tuition and fees scholarship is awarded annually to an outstanding high school student who enrolls in the fire protection curriculum of the College of Engineering. This scholarship is for four years.

Prince George's County Volunteer Firemen's Association Grant. An annual tuition and fees scholarship is awarded to an outstanding high school student who enrolls in the fire protection curriculum of the College of Engineering.

The Lester M. Fraley Honor Award to a Junior or Senior student of outstanding character majoring in the College of Physical Education, Recreation and Health who has demonstrated concern for citizenship and has shown superior scholarship in the University.

John D. Gilmore Scholarship has been established for the purpose of assisting deserving student athletes to obtain an education and participate in varsity athletics at The University of Maryland. The recipients should possess, as does John D. Gilmore, outstanding dedication, determination and an undeniable will to win in athletic competition and to succeed in life.

Goddard Memorial Scholarship of $500 each to students in the College of Agriculture. Several scholarships are available annually under the terms of the James and Sarah E.R. Goddard Memorial Fund established through the wills of Morgan E. Goddard and Mary Y. Goddard.

Manasses J. and Susanna Jarboe Grove Memorial Scholarship. Awarded to a student entering the junior or senior class preparing for a career in agronomy, animal dairy science, or horticulture. Recipient must have been born and educated in, and must be a legal resident of, Frederick County (Md.).

John William Guckeyson Memorial Scholarship. A scholarship of $100 is granted annually by Mrs. Hudson Dunlap as a memorial to John William Guckeyson, an honored Maryland alumnus.

Staley and Eugene Hahn Memorial Scholarship Fund. Annual awards of $500 are made by Mr. and Mrs. Walter J. Hahn in memory of their sons to aid outstanding agricultural students from Frederick County.

William Randolph Hearst Foundation Scholarships. These scholarships are made available through a gift of the Baltimore News American, one of the Hearst newspapers, in honor of William Randolph Hearst. Scholarships up to $1,000 are awarded annually to undergraduates pursuing a program of study in journalism. Scholarships up to $1,000 are awarded annually for graduate study in history.

Robert Michael Higgenbotham Memorial Award Fund. This Fund has been endowed by Mr. and Mrs. Charles A. Higgenbotham in memory of their son who was killed in Vietnam. Annual awards are made to promising junior students majoring in mathematics. Recipients are chosen by the Department of Mathematics.

Belva H. Hopkins Memorial Schoolrship. An endowed fund has been established to provide a scholarship to a deserving student from Prince George's County who has expressed an interest in teaching mathematics in public schools. The recipient may be entitled to renew the scholarship for three more years (or the normal graduating time) provided there is financial need. Financial need may be considered but is not a requirement for the initial award.

George Hyman Construction Company Scholarship. A tuition scholarship is awarded to a freshman student in civil engineering. The scholarship may be renewed for three more years so long as the student maintains a grade point average of 2.5.

Paul H. Kea Memorial Scholarship Fund. This fund was established by the Potomac Valley Chapter of the American Institute of Architects in memory of Paul H. Kea, a highly respected member of the chapter.

Venia M. Keller Grant. The Maryland State Council of Homemakers Club makes available this grant of $100 which is open to a Maryland young man or woman of promise who is recommended by the College of Human Ecology.

Mary Anne and Frank A. Kennedy Scholarship. Presented to outstanding journalism students, from the estate of Mary Anne and Frank A. Kennedy.

Kinghorne Fund Scholarship. A scholarship in honor of Mr. Joseph W. Kinghorne of the Class of 1911 of the College of Agriculture shall be awarded to the student specializing in poultry science having the highest general average at the end of his or her sophomore year. The amount of the scholarship shall equal the tuition on the College Park Campus. Selection of recipients is made by the Chairperson of the Department of Poultry Science.

Kiwanis Scholarship. The J. Enos Ray Memorial Scholarship covering tuition is awarded by the Prince George's Kiwanis Club to a male resident of Prince George's County, Maryland, who, in addition to possessing the necessary qualifications for maintaining a satisfactory scholarship record, must have a reputation of high character and attainment in general all-around citizenship.

Gary Lee Lake Memorial Scholarship. This endowed fund provides scholarships for students majoring in pre-veterinary science in the College of Agriculture. It was established by his family and friends. Recipients are selected by the College of Agriculture.

Laurel Race Course, Inc., Scholarship. This fund has been established to provide scholarships for students who are participating in the University Band.

Leidy Foundation Scholarships. A $1,500 fund has been established by the John H. Leidy Foundation, Inc. to provide scholarships for educational expenses to worthy students who have financial need.

Leidy Foundation Scholarship. A scholarship of $500 is granted annually to a graduate or undergraduate student preparing for a career in the general field of chemistry. Recipients are chosen by the Department of Chemistry.

Ransom R. Lewis Memorial Fund. Established in 1975 to honor Mr. Lewis, an alumnus and supporter of the athletic teams. Assists athletes in need of financial aid.

Helen Aletta Linthicum Scholarship. These scholarships, several in number, were established through the benefaction of the late Mrs. Aletta Linthicum, widow of the late Congressman Charles J. Linthicum, who served Congress from the Fourth District of Maryland for many years.

Lions Club of Silver Spring Memorial Scholarship. This scholarship covering tuition and fees is available to a worthy graduate of one of the following high schools: Montgomery Blair, Northwood or Springbrook.

Lions International Scholarship. An award of $500 is available to a freshman who competes in the Lions Club (District 22-C) Annual Band Festival. A recipient is recommended by the Music Department after a competitive audition in the spring.

Prince George's Plaza Lions Club Scholarship. This $300 scholarship is given in memory of Lion John L. Kensinger, Sr. The award is made to a student from Prince George's County whose area of academic concentration is in the field of creative writing.

The Alice Morgan Love Scholarship Fund is awarded to the Physical Education major who best exhibits the qualities of scholarship, leadership, and potential as a physical educator.

M Club Grants. The M Club of The University of Maryland provides each year a limited number of awards. Minta Martin Aeronautical Research Foundation Fund. Two scholarships are available to freshmen to cover tuition and fees.

Maryland-District of Columbia Association of Physical Plant Administrators Scholarship. A scholarship for fixed charges and fees is made available to a junior or senior who is interested in making the administration of a physical plant his career. The recipient must be a resident of Maryland or the District of Columbia.

Maryland Educational Foundation Grants. This fund has been established to provide assistance to worthy students.

Maryland Holstein Association Scholarship. The scholarship will be awarded to a deserving student in the College of Agriculture who has had a holstein project in 4-H or FFA. The award will be based on financial need, scholastic ability and leadership. Recipients are chosen by the College of Agriculture.

Maryland State Golf Association Scholarship. A limited number of $500 scholarships are available to undergraduates in the Agronomy Department who have an interest in golf turf work.

Maryland Turfgrass Association Scholarship. A $250 annual award is made to an undergraduate who has an interest in agronomy and commercial sod production.

Maryland and Virginia Milk Producers Association Scholarship. A scholarship of $500 is awarded annually in the College of Agriculture preferably to a student preparing for a career in the dairy industry.

George R. Merrill, Jr. Memorial Scholarship. Friends of former Professor George R. Merrill, Jr. have established this endowed scholarship fund to benefit students in Industrial Education.

Montgomery County Press Association Scholarship. Presented to an outstanding journalism residing in Montgomery County.

Loren L. Murray and Associates Scholarships. This fund has been created to provide scholarships for Maryland residents who are admitted to the College of Education.

Dr. Ray A. Murray Scholarship. The award, sponsored by Maryland Chapter No. 32 of the National Institute of Farm and Land Brokers, is to be made to a worthy sophomore in the Department of Agricultural and Resource Economics, College of Agriculture.

Noxell Foundation Scholarships. Two scholarships are awarded to senior chemistry majors nominated by the Department of Chemistry.

Pantry Pride Foundation Scholarship. Scholarships of $600 are awarded to sons and daughters of company employees. This scholarship is renewable for three years. To apply, contact the Pantry Pride Foundation.

Douglas Howard Phillips Memorial Scholarships. This scholarship fund has been endowed by Mr. and Mrs. Albanus Phillips, Jr., in honor of their son who met his untimely death in the spring before he was scheduled to attend the University, in order that worthy young male graduates of Cambridge (Maryland) High School may have the opportunity he missed.

Pilot Freight Carriers, Inc., Scholarship. An award of $500 to an outstanding student majoring in Transportation in the College of Business and Management.

Poffenberger Scholarship. Awarded to a student in the College of Agriculture who shows the greatest potential for making significant contributions to education and development in agriculture.

Ralston Purina Scholarship. A scholarship of $500 is awarded annually to an incoming senior or junior of the College of Agriculture.

J. Homer Remsberg Memorial Scholarship. A scholarship of $300 is awarded annually to a resident of Frederick County enrolled in the College of Agriculture.

R. J. Reynolds Tobacco Scholarship. Scholarships are designed for students in agriculture who show high academic potential, are U.S. citizens with preference to those who have a background in tobacco, related business or who intend to pursue studies in these areas.

Mary Elizabeth Roby Memorial Scholarship. An endowed scholarship has been established by the University Park Republican Women's Club. Limited awards are made to women entering the junior or senior years who are studying in the field of political science. A preference is given to residents of Prince George's County.

Vivian F. Roby Scholarships. This endowed fund was established through a bequest to The University of Maryland by Evalyn S. Roby in memory of her husband, class of 1912, to provide undergraduate scholarships to needy boys from Baltimore City and Charles County.

Jack B. Sacks Foundation Scholarship. An award of $1,000 on behalf of the Advertising Club of Metropolitan Washington, Inc., to an outstanding senior Marketing student in the College of Business and Management planning a career in advertising.

Schluderberg Foundation Scholarship Grant. This grant of $500 is awarded in the College of Agriculture to a student enrolled in the animal science or food science curriculum.

Dr. Fern Duey Schneider Grant. A $300 grant is available to a foreign woman student enrolled in the College of Education, who has completed at least one semester in residence at the University. Funds for the grant are contributed by the Montgomery and Prince George's County Chapters of the Delta Kappa Gamma Society.

Arthur H. Seidenspinner Scholarship. An endowed memorial scholarship fund has been established by Mrs. Seidenspinner to assist deserving student athletes to obtain an education at the University. Both Mr. and Mrs. Seidenspinner have been long-time contributors to numerous student aid

programs at the University

Southern States Cooperative. Two scholarships are awarded each year to sons/daughters of Southern States patrons—one for outstanding work in 4-H and the other for outstanding work in FFA. The amount of each scholarship is $800 for the first year and $600 per year for the succeeding three years.

Dr. Mabel S. Spencer Scholarship. This scholarship is awarded in honor of Dr. Spencer, distinguished former Professor in the College of Education. A preference shall be given to students in Home Economics Education.

David N. Steger Scholarship Fund. An annual award made to a graduate from North Carroll High School who will be an entering freshman at The University of Maryland pursuing studies in the field of agriculture.

T. B. Symons Memorial Fund. A scholarship award is made annually to a student enrolled in agriculture on the basis of academic achievement and financial need.

Charles A. Taff Scholarship. An award of $500 to an outstanding student majoring in Transportation in the College of Business and Management

Thomas H. Taliaferro Scholarship. Under the terms of the will of the late Jane G. S. Taliaferro, a bequest has been made to The University of Maryland to provide scholarship aid to worthy students.

Tau Beta Pi Scholarship Fund. A limited number of scholarships are made available each year to worthy engineering students by members and alumni of Maryland Beta Chapter of Tau Beta Pi Association, Inc., national engineering honor society.

Veterinary Science Scholarship. A scholarship of $300, provided by the veterinarians of Maryland, will be awarded to a student enrolled in Veterinary Science, selected on the basis of leadership, academic competence and financial need.

Western Electric Scholarships. Two scholarships are awarded to students in the College of Engineering. The amount of the scholarship covers the cost of tuition, books and fees not to exceed $800 nor to be less than $400.

Westinghouse Aerospace Division Scholarship. The Westinghouse Electric Corporation has established a scholarship to encourage outstanding students of engineering and the physical sciences. The scholarship is awarded to a sophomore student and is over a period of three years in six installments of $250. Students in electrical or mechanical engineering, engineering physics or applied mathematics are eligible for the award

Winslow Foundation Scholarship. Scholarships are awarded to deserving students in the College of Agriculture, in general areas of agriculture or pre-veterinary science who are in need of financial aid and who are residents of Maryland (preferably Montgomery County), the District of Columbia or North Carolina.

Women's Architectural League Scholarship. This fund has been established to aid worthy students in the School of Architecture.

Women's Club of Bethesda Scholarship. Several scholarships are available to young women residents of Montgomery County. Recipients must be accepted in the College of Education or the School of Nursing

Nicholas Brice Worthington Scholarship. A $500 memorial scholarship is made available to a student in the College of Agriculture by the descendants of Nicholas Brice Worthington, one of the founders of the Agricultural College.

ZONTA Scholarship. This scholarship of $500 is awarded annually to an incoming freshman woman majoring in aerospace engineering. This award is normally available for four years.

Loans

Loan funds are available to help meet the educational expenses of students enrolled at the University. The extent of financial need must be clearly established by submission of appropriate application materials.

Loans are normally given on a yearly basis, although short-term emergency loans are available. Loans may not be used for non-educational expenses nor for repayment of previously incurred indebtedness.

National Direct Student Loan Program. This loan fund was established by the federal government in agreement with The University of Maryland to make low-interest loans to students with demonstrated financial need. Applicants must be enrolled for six or more credits. To insure consideration, all application materials should be received by the Office of Student Financial Aid by the February 15 priority date, prior to the academic year for which the student is requesting funds. Applications received after this time will be considered on a funds available basis.

The borrower must sign a note. Repayment begins six months after the borrower leaves school and must be completed within ten years thereafter. Interests begin to accrue at the rate of 5% per annum once the repayment period commences.

Cancellation and deferment provisions are included for teachers of the handicapped, those in military service and those involved in non-profit volunteer service.

Institutional Student Loans. Institutional loan funds have been established through the generosity of University organizations, alumni, faculty, staff, and friends. These loans are normally available at low interest rates to qualified students. For specific information, contact the Office of Student Financial Aid.

PLUS Program. This loan program is open to graduate students, independent undergraduates, and parents of dependent undergraduate students. The maximum amount that can be borrowed is $3,000 per student per academic year with an aggregate maximum of $15,000 per student. Independent students, however, may borrow only $2,500 per year to a maximum of $12,500 including amounts borrowed under the GSL program. The interest rate is 12%. Repayment begins within 60 days. Principal payments may be deferred for *parent borrowers*. These loans are obtained from participating lenders. Allow at least two months for receipt of funds. Applications are available from the Office of Student Financial Aid or the lender.

Guaranteed Student Loan Program. This federal program allows students to borrow money from their hometown banks or other participating financial institutions. To qualify, students must be U.S. citizens, permanent residents, or refugees and be enrolled at least half-time. The program enables undergraduates to borrow up to $2,500 per academic year depending upon the financial need and the policies of the individual lenders. These loans bear an interest rate of eight percent, with interest and repayment commencing six months after the borrower leaves school. Students with Guaranteed Student Loans outstanding at 7 and 9 percent may continue to borrow at those rates.

Applications are available from the Office of Student Financial Aid or the local lender. *These forms should be completed at least two months before the funds are actually needed.*

Part-time Employment

College Work-Study Program. Under provisions of the Educational Amendments of 1976, employment may be awarded as a means of financial aid to students who (1) are in need of earnings from such employment to pursue a course of study at a college or university, and (2) are capable of maintaining good standing in the course of study while employed. Under the Work-Study Program, students may work up to twenty hours per week during the school year and a maximum of 40 hours during the summer. The amount of money that may be earned is determined by the student's demonstrated need.

Job Referral Service. The Office of Student Financial Aid through the Job Referral Service located in Room 3120, Hornbake Library, serves without charge as a clearinghouse for students seeking part-time work and for employers seeking help. Full-time summer employment opportunities are also available. Many jobs are available on and off campus.

Working during college years may offer advantages in addition to the obvious one of financing a college education. The employed student has a special opportunity to learn new skills, develop good work habits, and learn how to get along with people. Sometimes part-time employment helps students choose a vocation or acquire necessary experience.

Dining Hall Workship Program. Under the Dining Hall Workship Program, students may earn their board by working approximately twelve hours per week. After a successful semester, the workload may be increased at the student's request.

Students normally cannot make arrangements for employment until they are on campus at the beginning of the semester. Application must be made in person and the applicants should have a schedule of classes and study hours so that they can seek employment best suited to their free time.

Library Workship Program. Students may be awarded jobs under this program through the Office of Student Financial Aid. Students must follow usual financial aid application procedures and show financial need. The amount (generally about $1,200 per year) is credited to the student's account.

Awards and Prizes

Academic Awards

Milton Abramowitz Memorial Prize in Mathematics. A prize is awarded annually to a junior or senior student majoring in mathematics who has demonstrated superior competence and promise for future development in the field of mathematics and its applications.

Agricultural Alumni Award. Presented to a senior who during his or her college career contributed most toward the advancement of the College of Agriculture.

Agricultural Engineering Department's Outstanding Senior Award is presented to a student in Agricultural Engineering on the basis of scholastic performance, participation in ASAE National Student Branch, and other extra-curricular activities.

AIA Certificate. Awarded annually by the American Institute of Architects to a graduating student of architecture for academic achievement

AIA Medal. Awarded annually by the American Institute of Architects to a graduating student of architecture for outstanding overall academic achievement.

Allied Chemical Scholarship Award is presented to a student in Chemical Engineering on the basis of intellectual capacity, scientific ability, breadth of interest and leadership qualities.

Alpha Chi Sigma Award. The Alpha Rho Chapter of the Alpha Chi Sigma Honorary Fraternity offers annually a year's membership in the American Chemical Society to a senior majoring in Chemistry or Chemical Engineering whose average has been above 3.0 for three and one-half years

Alpha Lambda Delta Award. Presented to the senior member of the group who has maintained the highest average for three and a half years. She must have been in attendance in the institution for the entire time.

Alpha Lambda Delta Senior Certificate Award. Senior members of Alpha Lambda Delta, honorary scholastic society for women, who have maintained an average of 3.5 receive this certificate.

Alpha Rho Chi Medal. Awarded annually by the Alpha Rho Chi fraternity for architecture and the allied professions to a graduating student of architecture who has made a distinctive contribution to school life, embodying the ideals of professional service and leadership.

Alpha Zeta Medal. The Professional Agricultural Fraternity of Alpha Zeta awards annually a medal to the agricultural student in the freshman class who maintains the highest average in academic work.

Alumni Hamilton Award. This award is offered by the Engineering Alumni Chapter to the graduating senior in the College of Engineering who has most successfully combined proficiency in his or her major field of study with achievements—either academic, extra-curricular, or both—in the social sciences and humanities.

American Institute of Aeronautics and Astronautics Award. Free memberships in the Institute for one year and cash prizes for the best paper presented at a Student Branch meeting and for the graduating aeronautical senior with the highest academic standing.

American Institute of Chemical Engineers Award. A certificate, pin and magazine subscription are awarded to the junior member of the Student Chapter who attained the highest overall scholastic average during his or her freshman and sophomore years.

American Institute of Chemical Engineers Award is presented by the National Capital Section to an outstanding sophomore chemical engineering student.

American Institute of Chemical Engineers Professional Achievement Award is presented by the National Capital Section to an outstanding senior chemical engineering student.

American Institute of Chemists Award. Presented for outstanding scholarship in chemistry and for high character.

American Society of Civil Engineers Award. The Maryland Section of the American Society of Civil Engineers awards annually the first year's dues of an associate membership in the Society to a senior member of the Student Chapter on recommendation of the faculty of the Department of Civil Engineering.

American Society of Mechanical Engineers Senior Award. Presented to the senior member who has contributed most to the local chapter.

American Society for Testing Materials. Two student awards are given annually to engineering seniors in recognition of superior scholastic ability and demonstrated interest in engineering materials and their evaluation.

James R. Anderson Award in Geography. Awarded at each spring commencement to an outstanding undergraduate student in geography for high academic achievement.

Appleman-Norton Award in Botany is presented to a senior major in Botany who is considered worthy on the basis of demonstrated ability and excellence in scholarship.

David Arthur Berman Memorial Award is presented to two students majoring in Chemical Engineering with the highest cumulative scholastic averages at the end of the first semester of their junior year and who have been elected to Tau Beta Pi.

Dinah Berman Memorial Medal. The Dinah Berman Memorial Medal is awarded annually to the sophomore who has attained the highest scholastic average of his or her class in the College of Engineering. This medal is given by Mr. Benjamin Berman.

B'nai B'rith Award. The B'nai B'rith Women of Prince George's County present a Book award for Excellence in Hebrew Studies

The Donald T. Booney Honors Award is presented to the Chemical Engineering student who has made the most outstanding contribution to the profession as a member of the Honors Society, Omega Chi Epsilon.

Business Education Award of Merit to a student in Business Education in recognition of outstanding achievement as a student

Citizenship Prize For Men. An award presented annually as a memorial to the late President Emeritus H. C. Byrd to that male member of the senior class who during his collegiate career has most nearly typified the model citizen and has contributed significantly to the general advancement of the interests of the University

Citizenship Prize for Women. An award presented annually as a memorial to Sally Sterling Byrd to that female member of the senior class who during her collegiate career has most nearly typified the model citizen and has contributed significantly to the general advancement of the interests of the University.

CRC Engineering Science Achievement Award is presented to a junior in the College of Engineering for outstanding scholarship, leadership, and service.

Bernard L. Crozier Award. The Maryland Association of Engineers awards a cash prize of twenty-five dollars to the senior in the College of Engineering who, in the opinion of the faculty, has made the greatest improvement in scholarship during his or her stay at the University

Delta Delta Delta Medal. This sorority awards a medal annually to the woman who attains the highest average in academic work during the sophomore year.

Delta Gamma Scholarship Award. This award is offered to the woman member of the graduating class who has maintained the highest average during three and one-half years at the University.

Delta Sigma Pi Scholarship Key. Awarded to the senior with the highest overall scholastic average in the College of Business and Management.

Distinguished Accounting Student Awards. Awarded by The University of Maryland chapter of Beta Alpha Psi and the accounting faculty to the ten senior accounting students with the highest scholastic average in Accounting in the College of Business and Management.

Nathan L. Drake Award. Presented by the Alpha Rho Chapter of Alpha Chi Sigma to the most promising student who is majoring in chemistry and has completed the sophomore year,

Education Alumni Award. Presented to the outstanding senior man and senior woman in the College of Education.

Electrical Engineering Undergraduate Association Award is presented to an undergraduate in Electrical Engineering in recognition of outstanding service and leadership.

Engineering Alumni Chapter Award is presented to a senior in the College of Engineering for outstanding scholarship and service to the College of Engineering

Eta Kappa Nu Outstanding Senior Award is presented to a senior in Electrical Engineering for outstanding scholastic achievement and service to the society and department.

Forbes Chocolate Leadership Award of Cleveland, Ohio, presents a $100 leadership award to a major in Food Science.

The Geico Achievement Award is presented annually by the Government Employees Insurance Company (GEICO) to an outstanding sophomore or junior majoring in an insurance-related field such as Business Administration, Marketing or Economics. Nominations are made by the faculty based on academic achievement.

Wesley Gewehr Award. Phi Alpha Theta, History honorary, offers a cash award each year for the best undergraduate paper and the best graduate paper written on an historical topic. The entrance paper must be recommended by the history faculty of The University of Maryland.

Goddard Medal. The James Douglas Goddard Memorial Medal is awarded annually to the male resident of Prince George's County born therein, who makes the highest average in his studies and who at the same time embodies the most manly attributes. The medal is given by Mrs. Anne G. Goddard James of Washington, D.C.

Charles B. Hale Dramatic Awards. The University Theatre recognizes annually the male and female members of the senior class who have done most for the advancement of dramatics at the University.

P. Arne Hansen Memorial Award. Presented to the Outstanding Departmental Honors Student in Microbiology.

William Randolph Hearst Foundation Awards. Categories general news, features, editorials, investigative reporting, spot news

Robert M. Higginbotham Memorial Award. Award to an outstanding junior student majoring in Mathematics.

Home Economics Alumni Award. Presented to the female student outstanding in application of home economics in her present living and who shows promise of carrying these into her future home and community

The Joseph W. Houppert Memorial Fund. This fund will be the source of a cash prize to be awarded to the undergraduate student who writes the best essay on Shakespeare during the academic year.

Institute of Electrical and Electronics Engineering Award. The Washington Section of the Institute of Electrical and Electronics Engineers defrays the expenses of a year's membership as an associate in the institute for the senior doing the most to promote student branch activities.

Joe Elbert James Memorial Award. Gold watch annually awarded to the graduating senior in horticulture on basis of scholarship and promise of future achievement.

Charles Manning Prize in Creative Arts. Awarded annually to a University of Maryland student for achievement in the creative or performing arts.

Maryland-Delaware Press Association Annual Citation. Presented to the outstanding senior in journalism.

Maryland Recreation and Parks Society Award to the outstanding senior majoring in recreation.

The Men's League Award to the male senior who gave the most to sports.

Men's League Certificates. Offered for outstanding achievement, character and service to the University

Men's League Cup. This award is offered by the Men's League to the graduating male senior who has done the most for the male student body

Motor Fleet Supervisors Award to a student majoring in transportation in the College of Business and Management.

National Society of Fire Protection Engineers Awards. Presented to the most outstanding senior and sophomore in the fire protection curriculum.

Omicron Nu Sorority Medal. This honorary society awards a medal annually to the freshman woman in the College of Human Ecology who attains the highest scholastic average during the first semester.

L. W. Parker Memorial Award. Presented annually to a graduating student of Architecture for outstanding architectural craftsmanship.

Phi Beta Kappa Junior Award. An award to be presented to the junior initiate into Phi Beta Kappa who has attained the highest academic average.

Phi Beta Kappa—Leon P. Smith Award. The award of the Gamma of Maryland Chapter of Phi Beta Kappa is presented to the initiate senior with the highest cumulative scholastic average whose basic course program has been in the liberal studies.

Phi Chi Theta Key. The Phi Chi Theta Key is awarded to the outstanding graduating senior woman in the College of Business and Management on the basis of scholarship, activities and leadership.

Phi Sigma Awards for outstanding achievement in biological sciences to an undergraduate student and a graduate student.

Pi Tau Sigma Memorial Award. Presented to the senior in Mechanical Engineering who has made the most outstanding contribution to the University.

Pi Tau Sigma Outstanding Sophomore Award. Presented to the most outstanding sophomore in Mechanical Engineering on the basis of scholastic average and instructors' ratings.

Public Relations Society of America. The Baltimore Chapter of PRSA presents an annual citation to the outstanding senior majoring in public relations.

The Shipleys of Maryland Award. Cash award given to the graduating History major with the best academic record.

Sigma Alpha Omicron Award. This award is presented to a senior student majoring in microbiology for high scholarship, character and leadership.

Sigma Delta Chi Citation. For Achievement at The University of Maryland.

Sigma Delta Pi Award. Presented by the Department of Spanish and Portuguese to the graduating member of Sigma Delta Pi (National Spanish Honor Society) who has rendered the greatest service to the Delta (University of Maryland) Chapter.

Dr. Leo and Rita Sklar General Honors Awards. Dr. Leo Sklar, A&S '37, and his wife, Rita Sklar, annually fund awards for excellence in the General Honors Program. These awards are given to outstanding students in the General Honors Program.

Awards for Excellence in Teaching Spanish. Presented by the Department of Spanish and Portuguese to the three graduate assistants who have most distinguished themselves by the excellence of their teaching.

Awards for Excellence in the Study of Spanish. Presented by the Department of Spanish and Portuguese to the three members of the graduating class who have most distinguished themselves as students of Spanish language and literature.

Algernon Sydney Sullivan Award. The New York Southern Society, in memory of its first president, awards annually medallions and certificates to one man and one woman in the graduating class and one non-student who evince in their daily life a spirit of love for and helpfulness to other men and women.

Tau Beta Pi Award. The Maryland Beta Chapter of Tau Beta Pi Association, national engineering honor society, awards an engineer's handbook to the junior in the College of Engineering who during his or her sophomore year has made the greatest improvement in scholarship over that of his or her freshman year.

Tau Beta Pi Sophomore Improvement Award is presented to the junior in the College of Engineering who during the sophomore year has made the greatest percentage of possible improvement in scholarship over that of his or her freshman year.

Wall Street Journal Achievement Award. An award to the outstanding student in investments and security analysis in the College of Business and Management.

James P. Wharton Art Award Fund. This fund was endowed by the former head of the Art Department, Colonel James P. Wharton. An annual award of $200.00 is given to a senior for special achievement in Studio Art.

Athletic Awards

Atlantic Coast Conference Award. A plaque is awarded each year to a senior in each conference school for excellence in scholarship and athletics.

The Alvin L. Aubinoe Basketball Trophy. This trophy is given in memory of Alvin L. Aubinoe for the senior who has contributed most to the squad during the time the student was on the squad.

The Alvin L. Aubinoe Football Trophy. This trophy is given in memory of Alvin L. Aubinoe for the unsung hero of the current season.

The Alvin L. Aubinoe Track Trophy. This trophy is given in memory of Alvin L. Aubinoe for the senior who has contributed most to the squad during the time the student was on the squad.

Bob Beall-Tommy Marcos Trophy. This trophy is awarded to the best football lineman of the year.

John T. Bell Swimming Award. To the year's outstanding swimmer or diver.

Louis W. Berger Trophy. Presented to the outstanding senior baseball player.

Andrew M. Cohen Tennis Trophy. This trophy is awarded to the member of the tennis team who, judged by members of the team, contributed the most to tennis.

William P. Cole, III, Memorial Lacrosse Award. This award, offered by the teammates of William P. Cole, III, and the coaches of the 1940 National Champion team, is presented to the outstanding midfielder.

The George C. Cook Memorial Scholarship Trophy. Awarded annually to a member of the football team with the highest scholastic average.

Joe Deckman-Sam Silver Trophy. This trophy is offered by Joseph H. Deckman and Samuel L. Silver to the most improved defense lacrosse player.

Geary F. Eppley Award. Offered by Benny and Hotsy Alperstein to the graduating male senior athlete who during his three years of varsity competition, lettered at least once and attained the highest over-all scholastic average.

Halbert K. Evans Memorial Track Award. This award, given in memory of "Hermie" Evans of the Class of 1940, by his friends, is presented to a graduating member of the track team.

Jack Faber-Al Heagy Unsung Hero Award. Presented to the player who best exemplifies determination, will to win, and pride in accomplishment.

Tom Fields Award. This award is given to the most important member of the Cross Country team based on the qualities of leadership, dedication to excellence, attitude, and personal achievement.

Herbert H. Goodman Memorial Trophy. This trophy is awarded to the most outstanding wrestler of the year.

Jim Kehoe Ring Award. A Maryland Ring is awarded to the member of the track team whose dedication to excellence most closely exemplifies that of Jim Kehoe, one of Maryland's greatest trackmen.

Charles Leroy Mackert Trophy. This trophy is offered by William K. Krouse to the Maryland student who has contributed most to wrestling while at the University.

Maryland Ring. The Maryland Ring is offered as a memorial to Charles L. Linhardt, of the Class of 1912, to the Maryland man who is judged the best athlete of the year.

Charles P. McCormick Trophy. This trophy is given in memory of Charles P. McCormick to the senior member of the swimming team who has contributed most to swimming during the swimmer's collegiate career.

Edwin Powell Trophy. This trophy is offered by the Class of 1913 to the player who has rendered the greatest service to lacrosse during the year.

Silvester Watch for Excellence in Athletics. A gold watch, given in honor of former President of the University, R. W. Silvester, is offered annually to "the man who typifies the best in college athletics."

TEKE Trophy. This trophy is offered by the Maryland Chapter of Tau Kappa Epsilon Fraternity to the student who during four years at the University has rendered the greatest service to football.

Robert E. Theofeld Memorial. This trophy is presented by Dr. and Mrs. Harry S. Hoffman and is awarded to the golfer who most nearly exemplifies the competitive spirit and strong character of Robert E. Theofeld, a former member of the boxing team.

The Dr. Reginald Van Trump Truitt Award. This award is given to a senior attackman in lacrosse (midfield or attack) for scholastic attainments and team performance.

University of Maryland Swimming Association Scholar Athlete Award. This award is given to the swimmer who has compiled the best combination academic and aquatic record.

Air Force ROTC Awards

Aerospace Education Foundation W. Randolph Lovelace Memorial Award. Recognizes the most outstanding Air Force Association Award winner from each of the seven geographical areas.

Air Force Association Award to the outstanding senior cadet who has excelled in field training, possesses individual leadership characteristics, ranks in the upper 10% of his or her class in the university and the upper 5% of his or her ROTC class, and has outstanding promotion potential.

Air Force Historical Foundation Award to an AFROTC cadet/commissionee in recognition of leadership, citizenship, academic achievement, and military performance. Award is a $1,000 scholarship for graduate study in a field beneficial to Air Force and American Aviation Technology.

Air Force ROTC Field Training Awards. Awarded at field training for outstanding performance in specific areas of field training. Awards include AFROTC Commandant's Award, AFROTC Vice Commandant's Award, AFROTC Athletic Award, AFROTC Marksmanship Award, AFROTC Academic Achievement Award.

Air Force ROTC Sponsored Awards to cadets who have excelled in specific areas. Included are AFROTC Superior Performance Ribbon, AFROTC Leadership Ribbon; AFROTC Distinctive GMC Cadet Ribbon, College Scholarship Recipient Ribbon, and Category IP, IN, and IM Ribbons.

Air Force ROTC Valor Awards to cadets for voluntary act of valor (Gold valor award) involving physical risk without regard to personal safety or to a cadet for voluntary act of valor (Silver valor award) requiring strength of mind or spirit to react promptly and correctly in a critical situation.

Alumni Cup. Presented to the second semester Air Science senior cadet who has achieved the highest cumulative grade point average within the Corps of Cadets.

American Defense Preparedness Association Award. Presented to the outstanding senior cadet who has an academic average which places him or her in the upper half of his or her entire class at the University, has received no grade in the advanced ROTC courses less than B, is in upper 20% of total senior enrollment at The University of Maryland, has participated actively in athletics and/or campus activities, and has demonstrated outstanding leadership qualities.

American Defense Preparedness Association Scholarship. The $500.00 scholarship is presented to the most outstanding sophomore cadet who demonstrates outstanding qualities of a positive attitude, leadership potential as an officer, leadership performance as a cadet, presents an outstanding personal appearance and demonstrates high ideals of military bearing and courtesy.

American Fighter Aces Award recognizes the outstanding graduating cadet pilot in each geographical area based on his or her performance and achievements as an AFROTC cadet and his or her performance in the flight instruction program.

American Legion Outstanding Senior Cadet. This award is sponsored by the American Legion Department of Maryland, and is presented to the cadet best described as the "Outstanding ROTC Senior."

American Legion ROTC General Military Excellence Awards to a senior (Gold award) and a junior (Silver award) in the upper 25% of his or her AFROTC class demonstrating outstanding qualities in military leadership, discipline, and character.

American Legion ROTC Scholastic Award to an outstanding senior (Gold award) and junior (Silver award) who are in the upper 10% of their class in the University and have demonstrated high qualities in military leadership.

Angel Flight Freshman Award to the distinctive freshman cadet in the General Military Course.

Armed Forces Communications and Electronics Association Award to the outstanding senior cadet who is preparing for a career in this technical area and has demonstrated outstanding qualities of military leadership, high moral character, and definite aptitude for military service.

Armed Forces Communications and Electronics Association Scholarship Award. Awarded to a sophomore cadet ranked in the top 25 percent of the university class, has financial need and is accepted into the Professional Officers Course.

Armed Forces Communications and Electronic Association Scholarship Award of one $500 scholarship annually to a sophomore AFROTC cadet for undergraduate or University study in electrical engineering, communications engineering and/or technical photography.

Arnold Air Society GMC Cadet Award to the freshman or sophomore cadet who has demonstrated outstanding quality in areas of attitude, personal appearance, and military knowledge.

Coblentz Memorial Cup to the commander of the best drilled flight within the Corps of Cadets.

Commandant of Cadets Award to a junior or senior cadet for outstanding performance as a staff officer. This cadet most successfully exemplifies the "complete staff officer."

Daughters of the American Revolution Award to the senior cadet who has demonstrated high qualities of dependability, good character, adherence to military discipline, and leadership ability.

Daughters of Founders and Patriots of America Award to a qualified sophomore cadet who has demonstrated qualities of dependability, good character, adherence to military discipline, leadership potential, patriotism, and understanding of the importance of the American heritage and is also in the upper 10% of the sophomore cadets.

Disabled American Veterans Cup to the senior cadet who has displayed outstanding leadership, scholarship, and citizenship.

General Dynamics Award. Presented to the sophomore cadet who demonstrates outstanding qualities, possesses a positive attitude, good personal appearance, high personal attributes, military courtesy and high officer potential.

Governor's Cup to the one cadet chosen as Cadet of the Year in competition with all other cadets within the Corps.

Lt. Col. Virgil I. Grissom Memorial Award to junior cadets who have demonstrated outstanding academic ability and military achievements. Award consists of a $2,000 scholarship, with $1,000 granted annually.

Captain Fred H. Jones Award. Presented to the most outstanding member of the Maryland Honor Guard.

Legion of Valor Bronze Cross for Achievement Award recognizes one cadet from each geographical area for his performance and achievements as an AFROTC cadet.

Military Order of World Wars Award to the Aerospace Studies cadets recognized as the most improved within their year category.

National Sojourners Award to an outstanding sophomore or junior cadet who has contributed the most to encourage and demonstrate Americanism within the Corps of Cadets and on the campus.

Professor of Aerospace Studies Award to the senior cadet who has distinguished himself through excellence of leadership in the Corps of Cadets

George M. Reiley Award to the member of the flight instruction program showing the highest aptitude for flying as demonstrated by his or her performance in the program.

Reserve Officer Association Awards to the senior cadet (Gold award), junior cadet (Silver award), and sophomore cadet (Bronze award) demonstrating outstanding academic achievement in AFROTC subject matter and highest officer potential. Ribbons of merit are presented to the top 10 percent of the freshman and the sophomore cadets.

Retired Officers Association of Maryland, Prince George's County, Award. Presented to the sophomore cadet who, by living example, best typifies the term "Outstanding Officer Potential."

Society of American Military Engineers Award to recognize 20 junior or senior cadets nationally displaying outstanding scholastic achievement and leadership and majoring in the field of engineering

Sons of the American Revolution Award to a junior cadet in the Two-Year Program or a freshman cadet in the Four-Year Program who has shown a high degree of merit in his or her leadership qualities, soldierly bearing and all around excellence in the AFROTC program studies and activities.

Sun Newspaper Award to the best drilled sophomore cadet in the Corps of Cadets.

Tuskegee Airman Award. Presented to a cadet who exemplifies the "Tuskegee Spirit" of patriotism, pride and self-discipline by outstanding leadership, superior performance in the Aerospace Studies program.

Music Awards

Composition Prize to the outstanding student composition of the year.

Director's Award to the outstanding member of the Marching Band.

Kappa Kappa Psi Award to the most outstanding band member of the year.

Pi Kappa Lambda Scholar Award to the outstanding undergraduate student newly elected to membership in Pi Kappa Lambda.

Presser Scholar Award to the outstanding senior music major.

Sigma Alpha Iota Alumnae Award for outstanding musical performance.

Sigma Alpha Iota Dean's Honor Award for service and dedication.

Sigma Alpha Iota Honor Certificate to the senior with the highest scholastic average.

Sigma Alpha Iota Leadership Award based on personality, student activities, fraternity service, and scholarship.

Tau Beta Sigma Award to the outstanding band-sorority member of the year.

The Homer Ulrich Honors Awards In Music Performance. are presented each spring in honor of Homer Ulrich, Professor Emeritus and former Chairman of the Music Department. Three undergraduate and three graduate performers in piano, voice, and instruments are selected in a departmental competition to appear in a specially designated honors recital and to receive an honorarium.

Student Government Awards

Certificates of Appreciation are awarded to the members of the S G A. legislature and Keys to the members of the Cabinet.

Academic Regulations and Requirements

The academic regulations and requirements of The University of Maryland College Park are designed to provide and enhance a maximum educational environment for the entire campus academic community. The success of the design depends upon the mutual respect, courteous treatment, and consideration of everyone involved. The following statements contain procedures and expectations for both faculty and students. For questions about the interpretation of these statements, students should contact their academic advisor, department chair, or dean.

Resolution on Academic Integrity

Approved by Board of Regents: May 8, 1981

WHEREAS, It is the responsibility of The University of Maryland to maintain integrity in teaching and learning as a fundamental principle on which a university is built, and

WHEREAS, all members of the university community share in the responsibility for academic integrity, therefore

BE IT RESOLVED, that The University of Maryland Board of Regents hereby adopts the following Statement of Faculty, Student and Institutional Rights and Responsibilities for Academic Integrity

Statement of Faculty, Student and Institutional Rights and Responsibilities for Academic Integrity

Preamble

At the heart of the academic enterprise are learning, teaching, and scholarship. In universities these are exemplified by reasoned discussion between student and teacher, a mutual respect for the learning and teaching process, and intellectual honesty in the pursuit of new knowledge. In the traditions of the academic enterprise, students and teachers have certain rights and responsibilities which they bring to the academic community. While the following statements do not imply a contract between the teacher or the University and the student, they are nevertheless conventions which the University believes to be central to the learning and teaching process.

Faculty Rights and Responsibilities

1. Faculty shall share with students and administration the responsibility for academic integrity
2. Faculty are accorded freedom in the classroom to discuss subject matter reasonably related to the course. In turn they have the responsibility to encourage free and honest inquiry and expression on the part of students
3. Faculty are responsible for the structure and content of their courses, but they have the responsibility to present courses that are consistent with their descriptions in the University catalog. In addition, faculty have the obligation to make students aware of the expectations in the course, the evaluation procedures, and the grading policy
4. Faculty are obligated to evaluate students fairly and equitably in a manner appropriate to the course and its objectives. Grades shall be assigned without prejudice or bias
5. Faculty shall make all reasonable efforts to prevent the occurrence of academic dishonesty through the appropriate design and administration of assignments and examinations, through the careful safeguarding of course materials and examinations, and through regular reassessment of evaluation procedures.
6. When instances of academic dishonesty are suspected, faculty shall have the right and responsibility to see that appropriate action is taken in accordance with University regulations.

Student Rights and Responsibilities

1. Students shall share with faculty and administration the responsibility for academic integrity
2. Students shall have the right of inquiry and expression in their courses without prejudice or bias. In addition, students shall have the right to know the requirements of their courses and to know the manner in which they will be evaluated and graded
3. Students shall have the obligation to complete the requirements of their courses in the time and manner prescribed and to submit to evaluation of their work
4. Students shall have the right to be evaluated fairly and equitably in a manner appropriate to the course and its objectives
5. Students shall not submit as their own work any work which has been prepared by others. Outside assistance in the preparation of this work, such as librarian assistance, tutorial assistance, typing assistance, or such assistance as may be specified or approved by the instructor is allowed
6. Students shall make all reasonable efforts to prevent the occurrence of academic dishonesty. They shall by their own example encourage academic integrity and shall themselves refrain from acts of cheating and plagiarism or other acts of academic dishonesty
7. When instances of academic dishonesty are suspected, students shall have the right and responsibility to bring this to the attention of the faculty or other appropriate authority

Institutional Responsibility

1. Campuses or appropriate administrative units of The University of Maryland shall take appropriate measures to foster academic integrity in the classroom
2. Campuses or appropriate administrative units shall take steps to define acts of academic dishonesty, to insure procedures for due process for students accused or suspected of acts of academic dishonesty and to impose appropriate sanctions on students guilty of acts of academic dishonesty
3. Campuses or appropriate administrative units shall take steps to determine how admission or matriculation shall be affected by acts of academic dishonesty on another campus or at another institution No student suspended for disciplinary reasons at any campus of The University of Maryland shall be admitted to any other University of Maryland campus during the period of suspension.

AND, BE IT FURTHER RESOLVED, that campuses or appropriate administrative units of the University of Maryland will publish the above Statement of Faculty, Student and Institutional Rights and Responsibilities for Academic Integrity in faculty handbooks and in student handbooks and catalogs, and

BE IT FURTHER RESOLVED, that the Board of Regents hereby directs each campus or appropriate administrative unit to review existing procedures or to implement new procedures for carrying out the institutional responsibilities for academic integrity cited in the above Statement, and

BE IT FINALLY RESOLVED, that the Board of Regents hereby directs each campus or appropriate administrative unit to submit to the President or his designee for approval the campus' or unit's procedure for implementation of the institutional responsibility provisions of the above Statement.

Undergraduate Student Grievance Procedure

Approved by Board of Regents: April 14, 1981

I. Purpose

The following procedure provides a means for an undergraduate student to present a complaint resulting from a believed violation of the "Expectations of Faculty and Academic Units," set forth in Section II, below, to have that complaint examined as a matter of regular procedure, and to receive a final determination thereon This procedure offers a vehicle for seeking redress with respect to acts or omissions of individual faculty members, or of an academic department/program/college or division Redress may be sought under this procedure without fear of reprisal or discrimination.

II. Scope of Grievances: Expectations of Faculty and Academic Units

The academic regulations and requirements of the College Park campus are designed to provide and enhance a maximum educational environment for the entire campus academic community The success of the design depends upon the mutual respect, courteous treatment, and consideration of everyone involved.

A The following are considered to be reasonable student expectations of faculty:
   1. A written description at the beginning of each undergraduate course specifying in general terms the content, nature of assignments, examination procedures, and the bases for determining final grades In cases where all or some of this information cannot be provided at the beginning of the course, a clear explanation of the delay and the bases of course development shall be provided;
   2. Reasonable notice of major papers and examinations in the course,
   3. A reasonable number of recitations, performances, quizzes, tests, graded assignments and/or student/instructor conferences to permit evaluation of student progress throughout the course,
   4. Unless prohibited by statute or contract, a reasonable opportunity to review papers and examinations after evaluation by the instructor, while the materials remain reasonably current;
   5. A reasoned approach to the subject which attempts to make the student aware of the existence of different points of view:
   6. Reasonable access to the instructor during announced regular office hours or by appointment;
   7. Regular attendance by assigned faculty and reasonable adherence to published campus schedules and location of classes and examinations. Classes not specified in the schedules are to be arranged at a mutually agreeable time on campus, unless an off-campus meeting is clearly justified.
   8. Reasonable confidentiality of information gained through student-faculty contact.
   9. Public acknowledgement of significant student assistance in the preparation of materials, articles, books, devices and the like
   10. Assignment of materials to which all students can reasonably be expected to have access
B The academic units (programs, departments, colleges, schools, divisions) in cooperation with the Office of the Dean for Undergraduate Studies and the Office of Admissions and Registrations shall, whenever possible, provide the following
   1 Accurate information on academic requirements through designated advisors and referral to other parties for additional guidance
   2 Specific policies and procedures for the award of academic honors and awards and the impartial application thereof
   3 Equitable course registration in accordance with University policy and guidelines
C The scope of the matters which may constitute a grievance cognizable under this Undergraduate Student Grievance Procedure is limited to believed violations of the expectations of faculty and academic units set forth above in paragraphs A and B of this section.

III. Human Relations Code/Alternative Grievance Procedures

A Human Relations Code, with an implementing Office of Human Relations Programs, presently exists for the campus The Undergraduate Student Grievance Procedure and the Human Relations Code may not be used simultaneously or consecutively with one another with respect to the same (or substantially the same) issue/complaint or with respect to issues/complaints arising out of or pertaining to the same set of facts The procedures of the Human Relations Code and/or of any other University grievance/review process may not be utilized to challenge the procedures, actions, determinations or recommendations of any person(s) or board(s) acting pursuant to the authority and/or requirements of the Undergraduate Student Grievance Procedure.

IV. General Limitations

Notwithstanndng any provision of this Undergraduate Student Grievance Procedure to the contrary, the following matters do not constitute the basis for a grievance and are not susceptible of challenge thereby

A. Policies, regulations, decisions, resolutions, directives and other acts of the Board of Regents of The University of Maryland, of the Office of the President of The University of Maryland, and of the Chancellor of The University of Maryland College Park
B Any statute or any regulation, directive or order of any department or agency of the United States or the State of Maryland, and any other matter outside of the control of The University of Maryland.
C Course offerings
D The staffing and structure of any academic department or program
E. The fiscal management of The University of Maryland, and the allocation of University resources.
F. Any issue(s)/act(s) which does not affect the complaining party personally and directly
G Matters of academic judgment relating to an evaluation of a student's academic performance and/or of his/her academic qualifications; except that the following matters of a procedural nature may be reviewed under this Undergraduate Student Grievance Procedure if filed as a formal grievance within thirty (30) days of the first meeting of the course to which they pertain:
   1. Whether reasonable notice has been given as to the relative value of all work considered in determining the final grade and/or assessment of performance in the course—e g , the relative value of examinations, papers, laboratories and other academic exercises and requirements. The remedy with respect to a grievance based upon this subsection shall be the giving of notice by the faculty member.
   2. Whether a reasonably sufficient number of examinations, papers, laboratories and/or other academic exercises and requirements have been scheduled to present the student with a reasonable opportunity to demonstrate his/her academic merit. The remedy with respect to a grievance based upon this subsection shall be the scheduling of such additional academic exercises as the faculty member, in consultation with the provost and upon consideration of the written opinion of the divisional hearing board, shall deem appropriate.

Notwithstanding any language in this paragraph or elsewhere in this Undergraduate Student Grievance Procedure, nothing herein shall be construed to permit a challenge, either directly or indirectly, to the award of a specific grade.

No recommendation or decision may be made pursuant to the Undergraduate Student Grievance Procedure which conflicts with or modifies, directly or indirectly, any policy, statute, regulation or other matter set forth in paragraphs A and B of this section.

"Class" grievances and concomitant remedies are not cognizable, however, a screening or hearing board may, in its discretion, consolidate grievances presenting similar facts and issues, and recommend such generally applicable relief as it deems warranted.

V. Finality

A student who elects to utilize the Undergraduate Student Grievance Procedure agrees that in doing so he/she shall abide by the final disposition arrived at thereunder, and shall not subject this disposition to review under any other procedure within the University. For the purpose of this limitation, a student shall be deemed to have elected to utilize the Undergraduate Student Grievance Procedure when he/she files a written grievance as set forth in section VI A.2. and VI B. below.

VI. Procedure

A **Grievance Against Faculty Member, Academic Department, Program or College**

1 *Resolution of grievance by informal means.*
The initial effort in all cases shall be to achieve a resolution of the grievance through the following informal means:

a In the case of a grievance against an individual faculty member, the student should first contact the member, present the grievance in its entirety, and attempt a complete resolution. If any portion of the grievance thereafter remains unresolved, the student may present such part to the immediate administrative supervisor of the faculty member concerned. A grievance may be initially presented directly to the administrative supervisor of the faculty member if he or she is not reasonably available to discuss the matter. The supervisor shall attempt to mediate the dispute, should a resolution mutually satisfactory to both the student and the faculty member be achieved, the case shall be closed.

b In the case of a grievance against an academic department, program or college, the student should contact the department head, director or dean thereof, present the grievance in its entirety, and attempt a complete resolution.

2 *Resolution of grievance by formal means.*
Should a student be dissatisfied with the disposition of his/her grievance following the attempt to resolve it informally according to the steps set forth in subparagraph A 1. above, he/she may obtain a formal resolution thereof pursuant to the following procedure:

a The student shall file with the Screening Board for Academic Grievances of the Division (hereinafter "divisional screening board") from which the matter arises, a written grievance. The written grievance must set forth in detail:
(i) the act, omission or matter complained of;
(ii) all facts which the student believes to be relevant to the grievance;
(iii) the resolution sought;
(iv) all arguments upon which the student relies in seeking such resolution.

b In order to be considered, a grievance must be filed in a timely manner. To be filed in a timely manner, the written grievance (as set forth in subparagraph 2.a. above) must be *received* by the appropriate divisional screening board within thirty (30) days of the act, omission or matter which constitutes the basis of the grievance, or within thirty (30) days of the date the student is first placed upon reasonable notice thereof, whichever is later. It is the responsibility of the student to insure timely filing.

c. The divisional screening board shall immediately notify the faculty member against whom a grievance has been timely filed, or the head of the academic unit against which a grievance has been filed, and forward to them a copy of the grievance together with all other relevant material and information known to it. The faculty member or head of the academic unit shall within ten (10) days after receipt thereof, make a complete written response to the divisional screening board; in the event the faculty member receives the written grievance and other relevant materials and information from the divisional screening board after the last day of classes of the semester in which the grievance is filed, then the time for making a written response is extended to and includes ten (10) days after the first day of classes of the next succeeding semester in which the faculty member is teaching/working on campus (however, this extension shall not be available to a faculty member whose appointment terminates on or before the last day of the semester in which the grievance is filed). A copy of said response shall be sent by the divisional screening board to the student. In its discretion, the divisional screening board may request further written submissions from the student, the faculty member and/or the head of the academic unit.

d. The divisional screening board shall review the case to determine if a formal hearing is warranted.
(i) The divisional screening board shall dismiss all or part of a grievance which it concludes:
(a) is untimely;
(b) is based upon a nongrievable matter;
(c) is being pursued concurrently in another review/grievance procedure within the University and/or in a court of law or equity;
(d) has been previously decided pursuant to this or any other review/grievance procedure within the University and/or by a court of law or equity;
(e) is frivolous;
(f) is intended to harass, embarrass, and/or has otherwise been filed in bad faith.
(ii) The divisional screening board in its discretion may dismiss all or part of a grievance which it concludes:
(a) is unsufficiently supported;
(b) is premature;
(c) is otherwise inappropriate or unnecessary to present to the divisional hearing board.

e The divisional screening board shall meet and review grievances in private. A decision to dismiss a grievance shall require the majority vote of at least three members. If a grievance is dismissed either in whole or in part, the student shall be so informed and given a concise statement as to the basis for such action; however, the decision of the divisional screening board to dismiss a grievance is final and is not subject to appeal.

f If the divisional screening board determines that a grievance is appropriately one for a hearing, it will so inform the provost. The provost shall thereafter within fifteen (15) days convene a divisional hearing board to hear the grievance, except that for good cause in the discretion of the provost, such time may be extended.

g The following rules apply to the conduct of a hearing by the divisional hearing board:
(i) Reasonable notice of the time and place of the hearing shall be given to the student and the faculty member or head of an academic unit. Notice shall include a brief statement of the violation(s) alleged and the remedy sought by the student.
(ii) A record of the hearing, including all exhibits, shall be kept.
(iii) The hearing shall be closed to the public unless a public hearing is specifically requested by both parties.
(iv) Each party shall have an opportunity to make an opening statement, present evidence, present witnesses, cross-examine witnesses, offer personal testimony, and such other material as is relevant to the grievance. It is the responsibility of each party to insure that those witnesses whom he/she wishes to present are available, as well as to have his/her case completely prepared at the time of the hearing.
(v) The student shall first present his/her case, the faculty member or head of the academic unit shall then present his/her response.
(vi) Upon the completion of the presentation of all evidence, each party shall have an opportunity to present oral arguments and a closing statement. The chairman of the divisional hearing board may in his discretion set time limits upon such arguments and statements.
(vii) Upon the request of either party, all persons to be called as witnesses shall be sequestered.
(viii) Incompetent, irrelevant, immaterial and unduly repetitious evidence may be excluded in the discretion of the chairman of the divisional hearing board.
(ix) Each party may be assisted in the presentation of his/her case by a student or faculty memberr f his/her choice.
(x) It is the responsibility of the chairman of the divisional hearing board to manage the hearing and to decide all questions relating to the presentation of evidence and appropriate procedure, and is the final authority on all such matters, except as are specifically established herein.
(xi) All documents and materials filed with the divisional screening board by the student and the faculty member or the head of an academic unit, shall be forwarded to the divisional hearing board for its consideration, and shall become part of the record of the hearing.
(xii) The divisional hearing board shall have the right to examine any person or party testifying before it, and on its own motion, to request the presence of any person for the purpose of testifying and the production of any evidence the chairman believes to be relevant.
(xiii) The above-enumerated procedures and powers of the divisional hearing board are non-exclusive; the chairman of the divisional hearing board may take such action as is necessary in his/her determination to facilitate the orderly and fair conduct of the hearing and as is not inconsistent with the procedures set forth herein.

h Upon completion of the hearing, the divisional hearing board shall meet privately to consider the validity of the grievance. The burden of proof rests upon the student to establish a violation of the expectations of faculty and academic units, set forth in Section II, above, and any concomitant right to relief. It must be shown by a preponderance of the evidence that a substantial departure from the expectations has occurred, and that such substantial departure has operated to the actual prejudice and injury of the student. A decision by the divisional hearing board upholding the grievance, either in whole or part, shall require the majority vote of at least three members. The decision of the divisional hearing board shall

address only the validity of the grievance and shall be forwarded to the provost in a written opinion

i In the event the divisional hearing board decided in part or in whole on behalf of the student, it may submit an informal recommendation to the provost with respect to such relief as it may believe is warranted by the facts as proven in the hearing

j The provost shall immediately, upon receipt of the written opinion, forward copies to the student and the faculty member or head of the academic unit Each party has ten (10) days from the date of receipt to file with the provost an appeal of the decision of the divisional hearing board The sole grounds for appeal shall be

(i) a substantial prejudicial procedural error committed in the conduct of the hearing in violation of the procedures established herein Discretionary decisions of the chairman of the divisional hearing board shall not constitute the basis of an appeal;

(ii) the existence of new and relevant evidence of a significant nature which was not reasonably available, at the time of the hearing The appeal shall be in writing and set forth in complete detail the grounds relied upon A copy of the appeal shall also be sent to the opposite party, who shall have ten (10) days following receipt to file a written response with the provost

k In the absence of a timely appeal, or following receipt and consideration of all timely appeals and responses, the provost in his/her discretion may

(i) dismiss the grievance;

(ii) grant such redress as he/she believes is appropriate except that no affirmative relief shall be made to a student unless the student executes the following release:

"The complainant hereby waives, releases and covenants not to sue The University of Maryland or its officers, agents or employees with respect to any matters which were or might have been alleged as a grievance filed under the Undergraduate Student Grievance Procedure in the instant case, subject to performance by The University of Maryland, its officers, agents and employees, of the promises contained in a final decision under this Procedure."

(iii) reconvene the divisional hearing board to rehear the grievance in part or whole and/or to receive new evidence.

(iv) convene a new divisional hearing board to rehear the case in its entirety

l. The provost shall inform all parties of his/her decision in writing and the grievance shall thereafter be concluded The decision of the provost shall be final and binding, and not subject to appeal or review

B Grievance Against Administrative Dean for Undergraduate Studies, Divisional Provost

1. *Resolution of grievance by informal means.*
The initial effort in all cases shall be to achieve a resolution of the grievance through informal means The student should first contact the administrative dean or provost, present the grievance in its entirety, and attempt a complete resolution; if any portion of the grievance thereafter remains unresolved, the student may present such part to the Vice Chancellor for Academic Affairs A Grievance may be initially presented directly to the Vice Chancellor if the administrative dean or provost is not reasonably available to discuss the matter The Vice Chancellor shall attempt to mediate the dispute, should a resolution mutually satisfactory to both the student and the administrative dean/provost be achieved, the case shall be closed.

2. *Resolution of grievance by formal means.*
Should a student be dissatisfied with the disposition of his/her grievance following the attempt to resolve it informally according to the steps set forth in subparagraph B 1 above, he/she may obtain a formal resolution thereof pursuant to the following procedure:

a The student shall file with the Chancellor a written grievance The written grievance must set forth in dettal

(i) the act, omission or matter complained of,

(ii) all facts which the student believes to be relevant to the grievance,

(iii) the resolution sought,

(iv) all arguments upon which the student relies in seeking such resolution.

b In order to be considered, a grievance must be filed in a timely manner To be filed in a timely manner, the written grievance (as set forth in 2 a above) must be *received* by the Chancellor within thirty (30) days of the act, omission or matter which constitutes the basis of the grievance, or within thirty (30) days of the date the student is first placed upon reasonable notice thereof, whichever is later It is the responsibility of the student to insure timely filing

c. The Chancellor shall forward the grievance to the divisional screening board of a division other than that from which the grievance has arisen.

d The divisional screening board shall immediately notify the administrative dean/provost against whom a grievance has been timely filed and forward him/her a copy of the grievance with all other relevant material and information known to it The administrative dean/provost shall within ten (10) days after receipt thereof make a complete written response to the divisional screening board in the event the administrative dean/provost receives the written grievance and other relevant materials and information from the divisional screening board after the last day of classes of the semester in which the grievance is filed then the time for making a written response is extended to and includes ten (10) days after the first day of classes of the next succeeding semester A copy of said response shall be sent by the divisional screening board to the student In its discretion, the divisional screening board may request further written submissions from the student and/or the administrative dean/provost

e The divisional screening board shall thereafter review and act on the grievance in the same manner and according to the requirements set forth in subparagraphs A 2 d through A 2 e of this section, for the review of grievances against faculty members, academic departments programs and colleges

f If the divisional screening board determines that a grievance is appropriately one for a hearing it will so inform the Chancellor The Chancellor shall thereafter within fifteen (15) days, convene a campus hearing board to hear the grievance, except that for good cause in the discretion of the Chancellor, such time may be extended

g The campus hearing board shall conduct hearings in accordance with the rules established in subparagraph A 2 g above, for the conduct of hearings by a divisional hearing board Upon completion of a hearing, the campus hearing board shall meet privately to consider the grievance in the same manner and according to the same rules as set forth in subparagraph A 2 h, for the consideration of grievances by a divisional hearing board, except that the board's decision shall be forwarded to the Chancellor

h In the event the campus hearing board decides in part or in whole on behalf of the student, it may submit an informal recommendation to the Chancellor with respect to such relief as it may believe is warranted by the facts as proven in the hearing

i The Chancellor shall immediately, upon receipt of the written opinion, forward copies to the student and the administrative dean/provost Each party has ten (10) days from the date of receipt to file with the Chancellor an appeal of the decision of the campus hearing board The sole grounds for appeal shall be

(i) a substantial prejudicial procedural error committed in the conduct of the hearing in violation of the procedures established herein. Discretionary decisions of the Chairman of the campus hearing board shall not constitute the basis of an appeal,

(ii) the existence of new and relevant evidence of a significant nature which was not reasonably available at the time of the hearing

The appeal shall be in writing and set forth in complete detail the grounds relied upon. A copy of the appeal shall also be sent to the opposite party, who shall have ten (10) days following receipt to file a written response with the Chancellor.

j In the absence of a timely appeal, or following receipt and consideration of all timely appeals and responses, the Chancellor in his discretion may

(i) dismiss the grievance;

(ii) grant such redress as he/she believes is appropriate, except that no affirmative relief shall be made to a student unless the student executes the following release:

"The complainant hereby waives, releases and covenants not to sue The University of Maryland or its officers, agents or employees with respect to any matters which were or might have been alleged as a grievance filed under the Undergraduate Student Grievance Procedure in the instant case, subject to performance by The University of Maryland, its officers, agents and employees, of the promises contained in a final decision under this Procedure "

(iii) reconvene the campus hearing board to rehear the grievance in part or whole and/or to receive new evidence;

(iv) convene a new campus hearing board to rehear the case in its entirety

k The Chancellor shall inform all parties of his decision in writing, and the grievance shall thereafter be concluded The decision of the Chancellor shall be final and binding, and not subject to appeal or review

VII. Composition of Screening and Hearing Boards

The following procedures shall govern the selection, composition and establishment of the divisional screening boards, and the divisional and campus hearing boards. The procedures are directive only, and for the guidance and benefit of the provosts and Chancellor. The selection, composition and establishment of a board is not subject to challenge by a party as part of this grievance procedure or any other grievance/review procedure in the University, except that at the start of a hearing, a party may challenge for good cause a member(s) of the divisional or campus hearing board before whom the party is appearing. The chairman of the hearing board shall consider the challenge and may replace such member(s) if in his/her discretion it is believed such action is necessary to achieve an impartial hearing and decision. A challenge of the chairman shall be decided in the discretion of the most senior of the other faculty members on the board. Decisions with respect to a challenge shall be final and not subject to further review or appeal.

A **Divisional Screening Boards for Academic Grievances**

1. *Membership of Screening Boards*
   a. Prior to the beginning of each academic year, the divisional council of each division shall choose at least fifteen (15) faculty members and fifteen (15) students to be eligible to serve on boards considering academic grievances from that division. Concurrently, it shall choose three (3) other faculty members to be eligible to serve on boards considering academic grievances for the Administrative Dean for Undergraduate Studies. The names shall be forwarded to the provost and the Administrative Dean.
   b. Prior to the beginning of each academic year, the Administrative Council of the Administrative Dean for Undergraduate Studies shall choose at least fifteen (15) students to be eligible to serve on a screening board to review grievances arising within academic units under the administration of the Administrative Dean for Undergraduate Studies. These names shall be forwarded to the Administrative Dean.
2. *Establishment of Screening Boards*
   a. Upon receipt of the names of the designated faculty and students, the provost shall appoint a five-member divisional screening board which shall consist of three (3) faculty members and two (2) students, and each shall serve on the divisional screening board for the academic year or until a new board is appointed by the provost, whichever occurs later. The provost shall also designate two (2) alternative faculty members and two (2) alternative students from the names presented by the division council to serve on the divisional screening board should a vacancy occur. The provost shall designate one of the faculty members to be chairman of the divisional screening board. Members of the divisional screening board shall not serve on a divisional hearing board during the same year, except that alternative members may serve on a hearing board other than one considering a case in which the member had previously been involved in the screening process. A member of the divisional screening board shall not review a grievance arising out of his/her own department or program; in such instance, an alternative member shall serve in his/her place.
   b. Upon receipt of the names of the faculty members designated by each divisional council and the students designated by the administrative council, the Administrative Dean for Undergraduate Studies shall appoint a five-member screening board to review grievances arising within the academic units under his/her administration. This screening board shall thereafter be established and composed in accordance with the procedures set forth in subparagraph A 2 a of the section, for divisional screening boards.

B **Divisional Hearing Boards for Academic Grievances**

For each grievance referred by a divisional screening board, the provost shall appoint a five-member divisional hearing board. The divisional hearing board shall be composed of three (3) faculty members and two (2) students selected by the provost from among those names previously designated by the divisional council and not appointed to the divisional screening board. The provost shall designate one (1) faculty member as chairman. No faculty member or student shall be appointed to hear a grievance arising out of his/her own department or program. The Administrative Dean for Undergraduate Studies shall appoint in the same manner, a hearing board to hear each grievance referred by the screening board reviewing grievances arising from the academic units under his administration. The members of the hearing board shall be selected from among those names previously forwarded to the Administrative Dean by the divisional councils and from those who had not been appointed to the screening board.

C **Campus Hearing Board for Academic Grievances**

For each case referred by a divisional screening board to the Chancellor for a hearing, the Chancellor shall appoint a five-member campus hearing board. The campus hearing board shall be composed of three (3) faculty members and two (2) students selected by the Chancellor from among those names designated by the divisional councils and remaining after the establishment of screening boards. The Chancellor shall designate one faculty member as chairman. No faculty member or student shall be appointed to hear a grievance arising out of his/her own division or administrative unit.

VIII. Definitions

A **"Days"**
"Days" or "day" refer to days of the academic calendar, not including Saturdays, or Sundays.

B **"Party"**
"Party" or "parties" refer to the student and the individual faculty member or head of the academic unit against whom a grievance is made.

Procedures for Review of Alleged Arbitrary and Capricious Grading

Approved by Board of Regents: March 12, 1982

Purpose

1. The following procedures are designed to provide a means for undergraduate students to seek review of final course grades alleged to be arbitrary and capricious. Before filing a formal appeal, students are urged to resolve grievances informally with the instructor and/or the administrator of the academic unit offering the course. Students who file a written appeal under the following procedures shall be expected to abide by the final disposition of the appeal, as provided in part seven, and shall be precluded from seeking review of the matter under any other procedure within the University.

Definitions

2. When used in these procedures
   (a) the term "arbitrary and capricious" grading means i) the assignment of a course grade to a student on some basis other than performance in the course, or ii) the assignment of a course grade to a student by resorting to unreasonable standards different from those which were applied to other students in that course, or iii) the assignment of a course grade by a substantial, unreasonable and unannounced departure from the instructor's previously articulated standards.
   (b) the words "Day" or "Days" refer to working days at the University, excluding Saturdays, Sundays and University holidays.
   (c) the word "administrator" is defined as the administrative head of the academic unit offering the course.

Procedures

3. A student who believes his/her final grade in a course is improper and the result of arbitrary and capricious grading should first confer promptly with the instructor of the course. If the instructor has left the University or is on approved academic leave or cannot be reached by the student after a reasonable effort, the student shall consult with the administrator. If the student and the instructor or administrator are unable to arrive at a mutually agreeable solution, the student may file an appeal within twenty days after the first day of instruction of the next semester (excluding summer terms) to a standing committee consisting of three tenured faculty members of the academic unit offering the course. If the instructor of the course is a member of the committee, that instructor shall be disqualified and replaced by a tenured faculty member selected by the administrator.
4. The student shall file an appeal by submitting to the committee a written statement detailing the basis for the allegation that a grade was improper and the result of arbitrary and capricious grading, and presenting relevant evidence. The appeal shall be dismissed if, i) the student has submitted the same, or substantially the same, complaint to any other formal grievance procedure ii) the allegations, even if true, would not constitute arbitrary and capricious grading, iii) the appeal was not timely, or iv) the student has not conferred with the instructor or with the instructor's immediate administrative supervisor, in accordance with part three of these procedures.
5. If the appeal is not dismissed, the committee shall submit a copy of the student's written statement to the instructor with a request for a prompt written reply. If it then appears that the dispute may be resolved without recourse to the procedures specified in part six, the committee will attempt to arrange a mutually agreeable solution.
6. If a mutually agreeable solution is not achieved, the committee shall proceed to hold an informal, nonadversarial fact-finding meeting concerning the allegations. Both the student and the instructor shall be entitled to be present throughout this meeting and to present any relevant evidence, except that the student shall not be present during the discussion of any other student. Neither the student nor the faculty member shall be accompanied by an advocate or representative. The meeting shall not be open to the public.
7. The committee shall deliberate privately at the close of the fact-finding meeting. If a majority of the committee finds the allegation supported by clear and convincing evidence, the committee shall take any action which they feel would bring about substantial justice, including, but not limited to

i) directing the instructor to grade the student's work anew, or ii) directing the instructor to administer a new final examination or paper in the course, or iii) directing the cancellation of the student's registration in the course, or iv) directing the award of a grade of "pass" in the course except that such a remedy should be used only if no other reasonable alternative is available. The committee is not authorized to award a letter grade or to reprimand or otherwise take disciplinary action against the instructor. The decision of the committee shall be final and shall be promptly reported in writing to the parties. The administrator of the academic unit shall be responsible for implementing the decision of the committee.

The University Studies Program

The University Studies Program is the general education requirement at The University of Maryland College Park. This program must be completed by all students beginning baccalaureate study after May, 1980. It is intended to provide students with the intellectual skills and conceptual background basic to an understanding of the universe, society and themselves. The focus is not on any particular bodies of knowledge, for almost any subject matter can lead to an awareness of general modes of understanding the world. Thus, for example, it does not matter whether the student studies physics or botany as long as he or she comes away from the course with some understanding of the power of the empirical investigation that characterizes science.

The University Studies Program has three parts. The "Fundamental Studies" section of the program is intended to establish the student's ability to participate in the discourse of the university through demonstrated mastery of written English and mathematics. These requirements are to be completed early in the student's program in order to serve as a foundation for subsequent work.

The "Distributive Studies" requirement is intended, through study in particular disciplines, to acquaint students with the different ways of analyzing and talking about the world that characterize the three areas into which the university's knowledge is traditionally divided: the physical and biological sciences, the social and behavioral sciences, and the arts and humanities. The fourth category, "History and Culture," includes courses that lead to the consideration of historical and cultural differences and the relationship of our own society to those of other times and places.

In fulfilling "Distributive Studies" requirements, students will have gained some experience of the way in which scholars in different kinds of disciplines make and organize observations about the world and arrive at general statements.

It is the purpose of "Advanced Studies" courses to show how these different intellectual approaches compare with each other or may be used in complementary ways to analyze and solve problems. "Development of Knowledge" courses deal with the basis upon which people who use these different approaches claim to know something and the different kinds of insights to which these intellectual strategies lead. "Analysis of Human Problems" courses consider these matters in terms of specific cultural, social, scientific or aesthetic problems which may be approached from several points of view. Courses in both "Advanced Studies" categories require students to exercise critical thinking skills in the analysis of complex problems.

The University Studies requirements, designed to be spread throughout the student's four years, represent a third of the total academic work required for graduation. It is the purpose of this program, in combination with the extensive work of the major, to help prepare students to become productive, aware and sensitive members of society, capable of understanding their world and the many kinds of people in it and of taking responsibility for their own decisions and their own lives.

For a more specific outline of the Program requirements and the approved courses which may be selected to meet those requirements, see Part 4 of this catalog, entitled University Studies Program.

General University Requirements

Students who began baccalaureate study prior to May, 1980 may elect to complete these requirements rather than the University Studies Program requirements (see above).

In order to provide educational breadth for all students, there have been established the General University Requirements. These requirements consist of 30 semester hours of credit distributed among the three areas listed below. (For an exception to this regulation, see the Bachelor of General Studies Program, page 133.) At least 6 hours must be taken in each area. At least 9 of the 30 hours must be taken at the 300 level or above. None of the 30 hours may be counted toward published departmental, college or divisional requirements for a degree. Area A: 6–12 hours elected in the Divisions of Agricultural and Life Sciences; Mathematical and Physical Sciences and Engineering. Area B: 6–12 hours in the Divisions of Behavioral and Social Sciences; Human and Community Resources. Area C: 6–12 hours in the Division of Arts and Humanities.

In meeting these area requirements, students may choose from among any undergraduate courses for which they are qualified. The students may select either the pass-fail or letter grading option for these courses as outlined on page 52. Students are urged to consult with academic advisors for guidance in determining which courses in each area best fit individual needs and interests.

Demonstration of competency in English composition: unless the student has been exempted from English composition, at least one course in the subject will be required. Exemption is granted if the student earns an acceptable score on the SAT Verbal (score announced annually) or an acceptable score on the English Advanced Placement Test (score announced annually), or by satisfactory completion of a similar writing course at another institution.

Students taking a course to satisfy this requirement may apply the credits toward the 30-hour General University Requirement but may not count these credits toward the satisfaction of the minimum 6 hour requirement in any of the three designated areas or the 9-credit upper division requirement. Credit for such a course may be in addition to the 12-hour maximum in any area.

NOTE: Students who began baccalaureate study after May, 1978 must complete the English composition requirement specified in the Fundamental Studies section of the University Studies Program (see above). Only three hours of this six hour requirement may be used to satisfy General University Requirements.

Students who entered the University prior to June, 1973 have the option of completing requirements under the former General Education Program rather than the new General University Requirements. Each student is responsible for making certain that the various provisions of either set of requirements have been satisfied prior to certification for the degree. Assistance and advice may be obtained from the academic advisor or the Office of the Administrative Dean for Undergraduate Students.

Degrees and Certificates

The College Park Campus awards the following degrees: Bachelor of Architecture, Bachelor of Arts, Bachelor of General Studies, Bachelor of Music, Bachelor of Science, Master of Applied Anthropology, Master of Architecture, Master of Arts, Master of Business Administration, Master of Education, Master of Fine Arts, Master of Library Science, Master of Music, Master of Public Management, Master of Public Policy, Master of Science, Doctor of Education, Doctor of Musical Arts, and Doctor of Philosophy.

Students in specified two-year curricula may be awarded certificates.

The requirements for graduation vary according to the character of work in the different colleges, divisions and schools. Full information regarding specific college and division requirements for graduation will be found in Part 3 of this catalog.

Each candidate for a degree or certificate must file a formal application for it with the Office of Records & Registrations. This must be done by the deadline published in the *Schedule of Classes* for the semester of graduation.

Degree Requirements

It is the responsibility of departments, colleges, divisions, or appropriate academic units to establish and publish clearly defined degree requirements. Responsibility for knowing and meeting all degree requirements for graduation in any curriculum rests with the student. For requirements established by specific divisions, colleges and departments or other academic units, the student is referred to the appropriate descriptions in Part 3 of this catalog.

Each student should check with the proper academic authorities no later than the close of the junior year to ascertain his or her standing with respect to advancement toward a degree. For this purpose, each student should be sure to retain a copy of the semester grade reports issued by the Office of Records and Registrations at the close of each semester.

Second Degrees

a. *Second Degree Taken Sequentially.* A student who has completed requirements for and has received one baccalaureate degree and who wishes to earn a second baccalaureate degree from College Park must satisfactorily complete the requirements of the second degree and enough additional credits so that the total, including all applicable credits earned at College Park or elsewhere, is at least 150 credits. In no case, however, will a second baccalaureate degree be awarded to a student who has not completed 30 credit hours in residence at College Park. Approval of the second degree will not be granted when there is extensive overlap between the two programs.

b. *Second Degree Taken Simultaneously.* A student who wishes to receive simultaneously two baccalaureate degrees from College Park must satisfactorily complete a minimum of 150 credits (180 credits if one of the degrees is in Special Education). The regularly prescribed requirements of both degree programs must be completed. As early as possible and, in any case, no later than the beginning of the second semester before the expected date of graduation, the student must file with the departments or programs involved, as well as with the appropriate Deans and Provosts, formal programs showing the courses to be offered to meet the major, supporting area, college, division and University Studies Program or General University Requirements. If two divisions are involved in the double degree program, the student must designate which division is responsible for the maintenance of records. Approval of the second degree will not be granted when there is extensive overlap between the two programs.

Graduation Requirements

Credit Requirements for Graduation

While several undergraduate curricula require more than 120 credits, no baccalaureate curriculum requires fewer than 120. No baccalaureate degree will be awarded in instances in which fewer than 120 credit hours have been earned. It is the responsibility of each student to familiarize himself or herself with the requirements of specific curriculum. The student is urged to seek advice on these matters from the departments, colleges, divisions or the Office of Undergraduate Studies.

In order to earn a baccalaureate degree from College Park, a minimum of 30 credits must be taken in residence at the College Park Campus. Nothing stated below modifies this basic requirement in any way.

Grade Point Average

An overall C (2.00) grade point average is required for graduation in all curricula.

Off-Campus Courses

Courses taken at another campus of The University of Maryland or at another institution concurrent with regular registration on the College Park Campus may not be credited toward a College Park degree without advance approval by the Provost of the Division or the Dean of the College from which the student expects to receive a degree. For students not registered in any Division or College, the Dean for Undergraduate Studies shall assume the responsibilities normally delegated to Provosts and Deans. The same applies to off-campus registration in the summer program of another institution.

Residency Requirements—Final Thirty-Hour Rule

a. All candidates for College Park degrees should plan to take their final 30 credits in residence since the advanced work of their major study normally occurs in the last year of the undergraduate course. Included in these 30 semester hours will be a minimum of 15 semester hours in courses numbered 300 or above, including at least 12 semester hours required in the major field (in curricula requiring such concentrations).

b. A student who at the time of graduation will have completed 30 hours in residence at College Park may, under unusual circumstances, be permitted to take a maximum of six of the final 30 credits of record at another institution. In such cases, written permission must be obtained in advance from the dean or provost of the academic unit from which the student expects to receive the degree.

c. For students in the combined three-year, preprofessional programs, the final 30 hours of the 90-hour program taken at College Park must be taken in residence.

Enrollment in Majors

a. A student must be enrolled in the major program from which he or she plans to graduate, when registering for the final 15 hours of the baccalaureate program. This requirement also applies to the third year of the combined, preprofessional degree programs.

b. A student who wishes to complete a second major in addition to his or her primary major of record must obtain written permission in advance from the appropriate Deans and/or Provosts. As early as possible, but in no case later than the beginning of the second semester before the expected date of graduation, the student must file with the departments or programs involved and with the appropriate Deans and/or Provosts, formal programs showing the courses to be offered to meet requirements in each of the majors and supporting areas as well as the college, division and General University Requirements or University Studies Program requirements. Approval will not be granted if there is extensive overlap between the two programs. Students enrolled in two majors simultaneously must satisfactorily complete the regularly prescribed requirements for each of the programs. Courses taken for one major may be counted as part of the degree requirements for the other and toward the requirements for the University Studies Program. However, no course used in either curriculum to satisfy a major, supporting area, college or divisional requirement may be used to satisfy the General University Requirements. If two divisions are involved in the double major program, the student must designate which division is responsible for the maintenance of records.

Diploma Applications

Application for diplomas must be filed with the Office of Records and Registrations (a.) during the registration period, or (b.) not later than the end of the schedule adjustment period of the regular semester, or (c.) at the end of the first week of the second summer session. In all cases, diploma applications must be filed at the beginning of the student's final semester before receiving a degree.

If all degree requirements are not completed during the semester in which the diploma application was submitted, it is the responsibility of the student to file a new diploma application with the Office of Records and Registrations at the beginning of a subsequent semester when all degree requirements may be completed.

Credit Unit and Load Each Semester

The semester hour, which is the unit of credit, is the equivalent of a subject pursued one period a week for one semester. Two or three hours of laboratory or field work are equivalent to one lecture or recitation period. The student is expected to devote three hours a week in classroom or laboratory or in outside preparation for each credit hour in any course.

In order for an undergraduate student to complete most curricula in four academic years, the semester credit load must range from 12 to 19 hours so that he would complete from 30 to 36 hours each year toward the degree. A student registering for more than 19 hours per semester must have the special approval of his or her dean or provost.

Classification of Students

No baccalaureate curriculum requires fewer than 120 semester hours. Actual classifications run as follows: freshman, 1–27 semester hours; sophomore, 28–55; junior, 56–85; and senior, 86 to at least 120.

Registration

1. To attend classes at The University of Maryland it is necessary to process an official registration. Registration is final and official when all fees are paid. Instructions concerning registration are given in the *Schedule of Classes* issued at the beginning of each new semester.
2. Students are expected to notify the Office of Records and Registrations of any change in their local or permanent address. Procedures for notification may be found in the current *Schedule of Classes*, under "Change of Address Procedures."
3. The schedule adjustment period shall be the first 10 days of classes for the fall and spring semesters, and a corresponding period for summer semesters. During that period, a full-time undergraduate may drop or add courses or change sections with no charge. Part-time undergraduate students may also drop or add courses or change sections, but they should consult the directions/deadlines in the *Schedule of Classes* to avoid incurring additional charges. Courses so dropped during this schedule adjustment period will not appear on the student's permanent record. Courses may be added, where space is available, during this period and will appear on the student's permanent record along with other courses previously listed. After this schedule adjustment period, courses may not be added without special permission of the department and the dean or provost of the academic unit in which the student is enrolled.

   Departments may identify courses or sections of courses with the approval of the Office of the Vice Chancellor for Academic Affairs which, after the first five days of the schedule adjustment period, shall require faculty or departmental approval for students to add.

4. After this schedule adjustment period, all courses for which the student is enrolled (or subsequently adds) shall remain as a part of the student's permanent record. The student's status shall be considered as full-time if the number of credit hours enrolled at this time is 9 or more.
5. The drop period for undergraduate students will begin at the close of the schedule adjustment period and terminate at the end of the tenth week of classes during the fall and spring semesters, and at a corresponding period for summer sessions. During the drop period a student may drop a maximum of four credits. However, if the course that the student wishes to drop carries more than four credits, the student may drop the entire course or, in the case of a variable credit course, reduce the credit level by up to four credits. Such a drop will be recorded on the student's permanent record with the notation "W" and will be considered to represent a single enrollment (one of three possible) in the course. This mark shall not be used in any computation of cumulative grade point average. Students wishing to withdraw from all courses must do so on or before the last day of classes. After the initial schedule adjustment period, a charge shall be made for each course dropped or added.
6. An official class list for each course being offered is issued each semester to the appropriate department by the Office of Records and Registrations. No student is permitted to attend a class if his or her name does not appear on the class list. Instructors must report discrepancies to the Office of Records and Registrations. At the end of the semester, the Office of Records and Registrations issues to each department official grade lists. The instructors mark the final grades on the grade lists, sign the lists and return them to the Office of Records and Registrations.
7. Courses taken at another campus of the University or at another institution concurrent with regular registration on the College Park Campus are treated as off-campus courses and may not be credited without approval in advance by the provost of the division from which the student expects a degree. The same rule applies to off-campus registration or registration in the summer school of another institution.
8. A student who is eligible to remain at the College Park Campus may transfer among curricula, colleges, divisions or other academic units except where limitations on enrollments have been approved by the Board of Regents.
9. In all cases of transfer from one division to another on the College Park Campus, the provost of the receiving division, with the approval of the

student, shall indicate which courses, if any, in the student's previous academic program are not applicable to his or her new program, and shall notify the Office of Records and Registrations of the adjustments which are to be made in determining the student's progress toward a degree. Deletions may occur both in credits attempted and correspondingly in credits earned. This evaluation shall be made upon the student's initial entry into a new program, not thereafter. If a student transfers within one division from one program to another, his or her record evaluation shall be made by the provost in the same way as if he or she were transferring divisions. If the student subsequently transfers to a third division, the provost of the third division shall make a similar initial adjustment; courses marked "nonapplicable" by the second provost may become applicable in the third program.

10 In the cases of non-divisional students, the Dean for Undergraduate Studies shall assume the responsibilities normally delegated to provosts.

Concurrent Undergraduate-Graduate Registration

A senior at The University of Maryland who is within seven hours of completing the requirements for the undergraduate degree may, with the approval of his or her provost or dean, the chairman of the department concerned, and the Graduate School, register in the undergraduate division for graduate courses, which may later be counted for graduate credit toward an advanced degree at this University. The total of undergraduate and graduate courses must not exceed fifteen credits for the semester. Excess credits in the senior year cannot be used for graduate credit unless proper pre-arrangement is made. Seniors who wish to take advantage of this opportunity must formally apply for admission to the Graduate School.

Undergraduate Credit for Graduate Level Courses

Subject to requirements determined by the graduate faculty of the department or program offering the course, undergraduate students may register for graduate level courses, i.e., those numbered from 600 to 898, with the exception of 799, for undergraduate credit.

A student seeking to utilize the option will normally be in the senior year, have earned an accumulated grade point average of at least 3.0, have successfully completed, with a grade of B or better, the prerequisite and correlative courses, and be a major in the offering or a closely related department. The student will be required to obtain prior approval of the department offering the course.

Enrollment in a graduate level course does not in any way imply subsequent departmental or Graduate School approval for admission into a graduate program, nor may the course be used as credit for a graduate degree at The University of Maryland.

Combined Bachelor's/Master's Programs

In November 1983, the Board of Regents approved guidelines for combined bachelor's/master's programs. These programs will permit courses of study which lead to the award of both bachelor's and master's degrees following five years of study. For the superior student, this option for a dual-degree program offers a wide range of exciting and challenging opportunities on the College Park Campus.

A combined program is to be an integrated learning experience, not simply the completion of the required number of undergraduate and graduate credits. Since such a curriculum requires careful planning of courses in order to reflect the unique interests of a student, consultation with a faculty advisor is imperative.

The following conditions apply to a combined bachelor's/master's program:

1. A combined degree program is available only to students whose academic performance is exceptional, i.e., meeting stipulated grade point average requirements.
2. Faculty evaluations and recommendations may be required for admission to a combined degree program.
3. Students may apply to a combined program only after the completion of a sufficient number of credits to permit the evaluation of academic performance, normally during the sophomore year and certainly before the completion of 60 credits.
4. Students will work with faculty to develop a detailed academic and career plan which will include the final 60 credits of the bachelor's work plus the graduate courses to be completed for the master's degree.
5. Application for admission to the Graduate School should be made during the semester immediately prior to the completion of the credits in the bachelor's program. Admission to the Graduate School will be effective the semester after completing the credits required for the bachelor's degree.
6. The bachelor's degree requires a minimum of 120 credits; the master's degree requires a minimum of 30 credits. A maximum of 6 credits may be applied to both degrees.
7. Tuition and fees will be charged to the student in accordance with the student's admission status.
8. No more than one master's degree may be earned through a combined bachelor's/master's degree program.

For further information, contact the departmental directors of undergraduate and graduate programs.

Identification Cards

Photo Identification Cards are issued at the time the student first registers for classes. The card is to be used for the entire duration of enrollment and is valid each semester only when the student also possesses a current semester Registration Card.

Students who preregister will receive a new Registration Card along with their Class Schedule. This card will validate their Photo Identification Card. Both cards should be carried at all times.

Students who do not preregister will receive identification cards when they do register.

Together the Photo Identification Card and Registration Card can be used by all students to withdraw books from the libraries, for admission to most athletic, social, and cultural events, and as a general form of identification on campus. Students who have food service contracts use a separate identification card issued by the dining halls.

There is a replacement charge of $1.00 for lost or stolen registration cards and $7.00 for lost, stolen, or broken photo identification cards. (Note: the fee for broken cards applies to new photo identification cards issued after the fall 1977 semester.)

Questions concerning the identification system should be addressed to the Office of Records and Registrations (454–5365).

The Consortium of Universities of the Washington Metropolitan Area

The Consortium of Universities of the Washington Metropolitan Area consists of American University, The Catholic University of America, Gallaudet College, Georgetown University, George Washington University, Howard University, Mt. Vernon College, Trinity College, University of the District of Columbia, and The University of Maryland College Park (UMCP). Students enrolled in these institutions are able to attend certain classes at the other campuses and have the credit considered as "residence" credit at their own institutions. Payment of tuition for courses will be made at the student's home campus.

Degree-seeking UMCP undergraduates may participate in the Consortium program according to the following stipulations:

1. The desired course must be one that is not offered at UMCP. Mere convenience is not adequate justification for permission to take courses at other consortium schools.
2. Practica, internships, workshops and similar experimental learning courses cannot be taken at other consortium schools.
3. To be eligible, students must be degree-seeking students at UMCP and have junior standing (56 credits). An exception to this policy is approval for courses in Army and Navy ROTC programs.
4. A student seeking to take courses at other consortium schools must have the prior written consent of the major department, the comparable department at UMCP if the course is outside the major department, and the student's Dean.

College Park Campus undergraduates interested in additional information about the Consortium Program should contact the Consortium Coordinator, Mary-Ann Granger, in the Office of Records and Registrations, North Administration Building.

Academic Clemency

Undergraduate students returning to the College Park Campus after a separation of a minimum of five calendar years may petition the appropriate dean or provost to have a number of previously earned grades and credits removed from the calculation of their cumulative grade point average. Up to sixteen credits and corresponding grades from courses previously completed at any University of Maryland campus will be removed from calculation of the grade point average and will not be counted toward graduation requirements. The petition for clemency must be filed in the first semester of return to the campus. Approval is neither automatic nor guaranteed.

Veterans Benefits

Students attending the University under the Veterans Education Assistance Act (Title 38, U.S. Code) may receive assistance and enrollment certification at the Registrations Office on the 1st floor of the North Administration Building. For current procedures regarding enrollment certification and computation of benefits for undergraduate and graduate students, consult the current *Schedule of Classes*.

It is the responsibility of veterans and dependents receiving VA benefits to notify the certification officials in the Registrations Office of every change of course or program, at the same time the change is submitted to the University. The following types of changes must be reported: credit level or grade option change, change of major or division or college, change of address, graduation, academic dismissal reinstatement actions, and intent to transfer from the College Park Campus.

Attendance

1. The University expects each student to take full responsibility for his or her academic work and academic progress. The student, to progress satisfactorily, must meet the quantitative requirements of each course for which he or she is registered. Students are expected to attend classes regularly, for consistent attendance offers the most effective opportunity open to all students to gain a developing command of the concepts and materials of their course of study. However, attendance in class, in and of itself, is not a criterion for the evaluation of the student's degree of success or failure. Furthermore, absences (whether excused or unexcused) do not alter what is expected of the student qualitatively and quantitatively. Except as provided below, absences will not be used in the computation of grades, and the recording of student absences will not be required of the faculty.
2. In certain courses in-class participation is an integral part of the work of the course. A few examples would be courses in public speaking and group discussion, courses emphasizing conversation in foreign languages, certain courses in physical education, and certain laboratory sessions. Each department shall determine which of its courses fall into this category. It shall be the responsibility of the instructor in such courses to inform each class at the beginning of the semester that in-class participation is an integral part of the work of the course and that absences will be taken into account in the evaluation of the student's work in the course.
3. Laboratory meetings require special preparation of equipment and materials by the staff. A student who is not present for a laboratory exercise has missed that part of the course and cannot expect that he or she will be given an opportunity to make up this work later in the term.
4. Special provision for freshmen: the freshman year is a transitional year. Absences of freshmen in the basic freshman courses will be reported to the student's dean or division officer when the student has accumulated more than three unexcused absences.
5. Excuses for absences (in basic freshman courses and in courses where in-class participation is a significant part of the work of the course) will be handled by the instructor in the course in accordance with the general policy of his or her department and college.

Marking System

1. The following symbols are used on the student's permanent record for all courses in which he or she is enrolled after the initial registration and schedule adjustment period: A, B, C, D, F, I, P, S, and W. These marks remain as part of the student's permanent record and may be changed only by the original instructor on certification, approved by the department chairman and the dean or provost, that an actual mistake was made in determining or recording the grade.
2. The mark of A denotes excellent mastery of the subject. It denotes outstanding scholarship. In computations of cumulative or semester averages, a mark of A will be assigned a value of 4 quality points per credit hour. (See Minimum Requirements for Retention and Graduation below.)
3. The mark of B denotes good mastery of the subject. It denotes good scholarship. In computation of cumulative or semester averages a mark of B will be assigned 3 quality points per credit hour.
4. The mark of C denotes acceptable mastery. It denotes the usual achievement expected. In computation of cumulative or semester averages a mark of C will be assigned a value of 2 quality points per credit hour.
5. The mark of D denotes borderline understanding of the subject. It denotes marginal performance, and it does not represent satisfactory progress toward a degree. In computations of cumulative or semester averages a mark of D will be assigned a value of 1 quality point per credit hour.
6. The mark of F denotes failure to understand the subject. It denotes unsatisfactory performance. In computations of cumulative or semester averages a mark of F will be assigned a value of 0 quality points per credit hour.
7. The mark of P is a student option mark, equivalent to A, B, C, or D. (See Pass-Fail option below.) The student must inform the Office of Registrations of the selection of this option by the end of the schedule adjustment period.
8. The mark of S is a department option mark which may be used to denote satisfactory performance by a student in progressing thesis projects, orientation courses, practice teaching and the like. In computation of cumulative averages a mark of S will not be included. In computation of quality points achieved for a semester, a mark of S will be assigned a value of 2 quality points per credit hour.
9. The mark of I is an exceptional mark which is an instructor option. It is given only to a student whose work in a course has been qualitatively satisfactory, when, because of illness or other circumstances beyond the student's control, he or she has been unable to complete some small portion of the work of the course. In no case will the mark I be recorded for a student who has not completed the major portion of the work of the course. The student will remove the I by completing work assigned by the instructor; it is the student's responsibility to request arrangements for completion of the work. These arrangements must be documented in an Incomplete Contract, signed by both the student and the instructor. (See "Incomplete Contracts," below.) The I cannot be removed through re-registration for the course or through the technique of "credit by examination." In any event this mark shall not be used in any computation of quality points or cumulative averages.
10. The mark of W is used to indicate withdrawal from a course in which the student was enrolled at the end of the schedule adjustment period. For information and completeness, the mark of W is placed on the student's permanent record by the Office of Records and Registration. The Office of Registrations will promptly notify the instructor that the student has withdrawn from the course. This mark shall not be used in any computation of quality points or cumulative average totals at the end of the semester.
11. Audit. A student may register to audit a course or courses in which space is available. The notation AUD will be placed on the transcript for each course audited. A notation to the effect that this symbol does not imply attendance or any other effort in the course will be included on the transcript in the explanation of the grading system.

Pass-Fail Option

1. An undergraduate who has completed 15 or more credit hours at the College Park Campus and has a cumulative average of at least 2.00 may register for courses on the Pass-Fail option during any semester or summer session.
2. Certain divisional requirements, major requirements or field of concentration requirements do not allow the use of the Pass-Fail option. Certain courses within a department may be designated by that department as not available under the Pass-Fail option. It is the responsibility of each student electing this option to ascertain in conjunction with his or her dean, provost, department or major advisor whether the particular courses will be applicable to his degree requirements under the Pass-Fail option.
3. No more than 20 percent of the College Park Campus credits offered toward the degree may be taken on the Pass-Fail option basis.
4. Students registering for a course under the Pass-Fail option are required to complete all regular course requirements. Their work will be evaluated by the instructor by the normal procedure for letter grades. The instructor will submit the normal grade. The grades A, B, C, or D will be automatically converted by the Office of Records and Registrations to the grade P on the student's permanent record. The grade F will remain as given. The choice of grading option may be changed only during the schedule adjustment period for courses in which the student is currently registered.

Incomplete Contracts

1. An "Incomplete Contract" is an agreement between a student and an instructor for the completion of coursework under conditions described in Item 9 of the section on the Marking System (see above). It is the student's responsibility to request that an "Incomplete Contract" be written.
2. Arrangements for the completion of coursework must be documented in an "Incomplete Contract" signed by the instructor and the student. A copy of the signed agreement should be filed in the Department Office.
3. All coursework required by an "Incomplete Contract" must be completed by the end of the next semester in which the course is again offered and in which the student is in attendance at the College Park Campus. If the instructor is unavailable, the department chairperson will, upon the request of the student, make the arrangements for the student to complete the coursework according to the requirements for an "Incomplete Contract" outlined above.
4. Exceptions to the time period cited above may be granted by the student's Dean or Provost upon the written request of the student if circumstances are deemed to warrant further delay. The new completion date must again be specified and agreed to in writing by the student and the Dean or Provost.
5. It is the responsibility of the instructor or the department chairperson concerned to return the appropriate supplementary grade report, both to the appropriate Dean or Provost and to the Office of Records and Registrations, upon completion of the conditions in the "Incomplete Contract."

Minimum Requirements for Retention and Graduation

1. A minimum of 120 credits of successfully completed (not I, F, or W) course credits is required for graduation in any degree curriculum (*See Degree Requirements and Credit by Examination* above.) Credits transferred, or earned during prior admissions terminating in academic dismissal or withdrawal and followed by readmission, will be applicable toward meeting credit requirements for a degree. *(See Readmission and Reinstatement above.)*
2. Academic retention is based solely upon grade point average (G.P.A.). The significance of the cumulative grade point average (cumulative G.P.A.) varies according to the number of credits attempted.
   a. *Semester Academic Honors* will be awarded to a student who completes within any given semester 12 or more credits (excluding courses with grades of P and S) with a semester G.P.A. of 3.500 or

higher. This notation will be placed on the individual's permanent record.

b. *Satisfactory Performance* applies to those students with a cumulative G.P.A. between 4.000 and 2.000.

3. Students with cumulative G.P.A. of less than 2.000 fall into three categories: *Unsatisfactory Performance*, *Academic Warning*, and *Academic Dismissal*. These notations will be placed on the student's permanent record. The cumulative G.P.A. that defines each of the categories varies according to the credit level as noted below:

Credit Level	*Unsatisfactory Performance*	*Academic Warning*	*Academic Dismissal*
0–13	1.999–1.290	1.289–0.230	0.229–0.000
14–28	1.999–1.780	1.779–1.280	1.279–0.000
29–56	1.999–1.860	1.859–1.630	1.629–0.000
57–74	1.999–1.940	1.939–1.830	1.829–0.000
75–more	– – – –	1.999–1.940	1.939–0.000

4. Credits completed with grades of A, B, C, D and F, but not P and S, will be used in computation of the semester and cumulative G.P.A. with values of 4.000, 3.000, 2.000, 1.000 and 0.000 respectively. Marks of I, W and NGR will not be used in the computation of semester and cumulative G.P.A.
5. Students with an unsatisfactory performance for any semester will be urged in writing to consult their advisors.
6. Students on academic warning will have this fact noted on their transcripts and will be urged in writing to consult with their advisors prior to the beginning of the next semester. Students who receive an academic warning in any semester will not be allowed either to add or drop courses or to register during the semester following the receipt of the academic warning without seeing an advisor.
7. Any student with 60 credits or more attempted and who thereafter received academic warning for two consecutive semesters will be academically dismissed. Students who are academically dismissed will have this action entered on their transcript.
8. No student transferring to The University of Maryland College Park from outside The University of Maryland System will be subject to Academic Dismissal at the end of the first semester as long as the student obtains a cumulative G.P.A. of 0.23 or more. (A student who would otherwise be subject to Academic Dismissal will receive an Academic Warning.) Thereafter, such a student will be subject to the normal standards of academic progress. This provision does not apply to students reinstated or readmitted to the College Park Campus.
9. A student who has been academically dismissed and who is reinstated will be academically dismissed again if minimum academic standards are not met by the end of the first semester after reinstatement (see below). In the computation of the cumulative G.P.A., all credits attempted at The University of Maryland will be used.
10. Under unusual circumstances, the Faculty Petition Board may set more rigorous requirements for the semester in which a reinstated student returns, or may allow a lengthened period (not to exceed two semesters) to reach the minimum or set academic standards.
11. Any appeal from the regulations governing academic warning or academic dismissal shall be directed to the Faculty Petition Board which shall be empowered to grant relief in unusual cases if the circumstances warrant such action.
12. A student may repeat any course; however no student may be registered for a course more than three times. If a student repeats a course in which he or she has already earned a mark of A, B, C, D, P or S, the subsequent attempt shall not increase the total hours earned toward the degree. Only the highest mark will be used in computation of the student's cumulative average. Under unusual circumstances, the student's dean or provost may grant an exception to this policy.

Dismissal of Delinquent Students

The University reserves the right to request at any time the withdrawal of a student who cannot or does not maintain the required standard of scholarship, or whose continuance in the University would be detrimental to his or her health, or to the health of others, or whose conduct is not satisfactory to the authorities of the University. Specific scholastic requirements are set forth in the Minimum Requirements for Retention and Graduation. Additional information about the dismissal of delinquent students may be found in the *Code of Student Conduct*.

Withdrawal From the University

1. Should a student desire or be compelled to withdraw from the University at any time, he or she must secure a form for withdrawal from the Records Office, and submit the form along with the semester Identification/Registration card.
2. The effective date of withdrawal as far as refunds are concerned is the date that the withdrawal form is received by the Records Office. A notation of *Withdrawn* and the effective date of the withdrawal will be posted to the permanent record. The instructors and the Divisional Offices will be notified of all withdrawn students. The deadline date for submitting the withdrawal form for each semester is the last day of classes.

Readmission and Reinstatement

Students who do not maintain continuous registration must apply for readmission or reinstatement when they desire to return to the University. See sections on Minimum Requirements for Retention and Graduation.

Readmission. A student who has interrupted registration for one or more semesters and who was in good academic standing or on academic probation at the conclusion of the last semester registered must apply for readmission.

Reinstatement

1. A student who withdraws from the University must apply for reinstatement to the Reenrollment Office. The applications are subject to review by the Faculty Petition Board.
2. A student who has been dismissed for academic reasons must file an application for reinstatement. Applications may be filed the semester immediately following the dismissal. All applications are reviewed by the Faculty Petition Board whose members are empowered to grant reinstatement to the University if the circumstances warrant such action.
3. A student who has been dismissed from the University for academic reasons and whose petition for reinstatement is denied may apply for reinstatement any subsequent semester. It is recommended that the student give serious consideration to the previous recommendations of the Faculty Petition Board.

Deadlines. Dismissed students who wish to apply for reinstatement must observe the following deadlines:

Fall semester—June 15
Spring semester—November 1
Summer Session I—April 15
Summer Session II—May 15

There are no deadlines for readmission but students are encouraged to apply early.

Exceptions. Students dismissed at the end of the fall or spring semester may apply for immediate reinstatement. Information will be provided to all dismissed students by the Office of Reenrollment. Students who are dismissed at the end of the fall semester and who are denied reinstatement for the spring semester are *not* eligible to attend Summer School. Students dismissed at the end of the spring semester may attend the first or second summer session. They must be reinstated, however, in order to attend during the fall semester. Students requiring clearance from Judicial Affairs Office, Health Center or International Education Office must submit the required forms with their application.

Any student who was previously admitted to the University and did not register for that semester must apply for admission. Also, any student who was previously admitted to the University, registered, but cancelled the only registration, must apply for admission.

Applications. Application forms for readmission and reinstatement may be obtained from the Office of Reenrollment, Room 1117, North Administration Building.

Additional Information. For additional information contact the Reenrollment Office, North Administration Building, The University of Maryland, College Park, MD 20742. Telephone. (301) 454–2734.

Examinations

1. All examinations and tests shall be given during class hours in accordance with the regularly scheduled (or officially "arranged") time and place of each course listed in the *Schedule of Classes* and/or the *Undergraduate Catalog*. Unpublished changes in the scheduling or location of classes/tests must be approved by the department chairman and reported to the Provost. It is the responsibility of the student to be informed concerning the dates of announced quizzes, tests and examinations.
2. It is the policy of the University to excuse the absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations and other written tests that fall on religious holidays. Examinations and other written tests may not be scheduled on Rosh Hashannah, Yom Kippur, or Good Friday. An instructor is not under obligation to give a student a make-up examination unless the absence was caused by illness, religious observance, participation in University activities at the request of University authorities, or compelling circumstances beyond the student's control. In cases of dispute, the student may appeal to the chair of the department offering the course within one week from the date of the refusal of the right to take a make-up exam.

   A make-up examination, when permitted, must be given on campus, unless the published schedule and course description require other arrangements. The make-up examination must be at a time and place mutually agreeable to the instructor and student, cover only the material for which the student was originally responsible, and be given within a time limit that retains currency of the material. The make-up must not interfere with the student's regularly scheduled classes. In the event that a group of

students require the same make-up examination, one make-up time may be scheduled at the convenience of the instructor and the largest possible number of students involved. Under the same guidelines students shall have equal access to all information and drills missed due to the reasons listed.

3 A final examination shall be given in every undergraduate course. Exceptions may be made with the written approval of the chairman of the department and the dean or provost. In order to avoid basing too much of the semester grade upon the final examination, additional tests, quizzes, term papers, reports and the like should be used to determine a student's comprehension of a course. The order of procedure in these matters is left to the discretion of departments or professors and should be announced to a class at the beginning of a course. All final examinations must be held on the examination days of the Official Final Examination Schedule. No final examination shall be given at a time other than that scheduled in the Official Examination Schedule without written permission of the department chairman.

4 As of fall semester, 1980, graduating seniors will be expected to take final exams during the regular examination period. However, graduating seniors are not required to take final examinations on the day of graduation or on any regularly scheduled examination day following graduation. In courses with exams scheduled on those days, graduating seniors are expected to see their instructors early in the semester to make alternate arrangements.

5 A file of all final examination questions must be kept by the chairman of each department.

6 The chairman of each department is responsible for the adequate administration of examinations in courses under his or her jurisdiction. The deans and provosts should present the matter of examinations for consideration in staff conferences from time to time and investigate examination procedures in their respective colleges and divisions.

7 Every examination shall be designed to require for its completion not more than the regularly scheduled period.

8 A typewritten, mimeographed or printed set of questions shall be placed in the hands of every examinee in every test or examination requiring at least one period, unless the dean or provost has authorized some other procedure.

9 Each instructor must safeguard examination questions and all trial sheets, drafts and stencils.

10 Each instructor should avoid the use of examination questions which have been included in recently given examinations and should prepare examinations that will make dishonesty difficult.

11 Only clerical help approved by the department chairman shall be employed in the preparation or reproduction of tests or examination questions.

12 Proctors must be in the examination room at least ten minutes before the hour of a final examination. Provisions should be made for proper ventilation, lighting and a seating plan. At least one of the proctors present must be sufficiently cognizant of the subject matter of the examination to deal authoritatively with inquiries arising from the examination.

13 Books, papers, etc. belonging to the student, must be left in a place designated by the instructor before the student takes his or her seat, except in such cases where books or work sheets are permitted.

14 Students should be seated at least every other seat apart, or its equivalent, i.e., about three feet. Where this arrangement is not possible some means must be provided to protect the integrity of the examination.

15 "Blue books" only must be used in periodic or final examinations, unless special forms are furnished by the department concerned.

16 If mathematical tables are required in an examination, they shall be furnished by the instructor. If textbooks are used, this rule does not apply.

17 Proctors must exercise all diligence to prevent dishonesty and to enforce proper examination decorum, including abstention from smoking.

18 Where an instructor must proctor more than 40 students, he or she should consult the chairman of the department concerning proctorial assistance. An instructor should consult the department chairman if in his or her opinion a smaller number of students for an examination requires the help of another instructor.

19 No student who leaves an examination room will be permitted to return, except in unusual circumstances, in which case permission to do so must be granted by the proctor prior to the student's departure.

20 All conversation will cease prior to the passing out of examination papers, and silence will be maintained in the room during the entire examination period.

21 Examination papers will be placed face down on the writing surface until the examination is officially begun by the proctor.

22 Examination papers will be kept flat on the writing surface at all times.

Examinations on Religious Holidays

The reader is referred to item two (2) under *Examinations* above for information about University policy on examinations on religious holidays.

Proficiency Examination Programs

Whether you are a new, a continuing, or a returning student, the College Park Campus offers several opportunities to earn college credit through satisfactory achievement in a variety of examinations.

Currently undergraduate students may earn credit through the various proficiency examination programs up to a total of one-half of the credits required for their degree. It is the student's responsibility to consult with the appropriate divisional officer, dean and advisor with regard to applicability of any credit earned by examination to a specific degree program and to determine courses which should *not* be elected in order to avoid duplication. *A student will not receive credit for both passing an examination in a course and completing the same course.*

Students with specific questions about the University's policy may contact the Director, Special Advising Programs, Room 1117, Hornbake Library (454–2731).

Three proficiency examination programs are recognized for credit by the College Park Campus:

Advanced Placement Program (A.P.). Please consult the description of this program under Admissions and Orientation.

College Level Examination Program (CLEP). This program exists for the purpose of awarding proficiency credit, or of otherwise recognizing college level competence, achieved outside the college classroom. Two types of CLEP tests are available: General Examinations, which cover the content of a broad field of study, and Subject Examinations, which cover the specific content of a college course. Credit can be earned and will be recognized by the College Park Campus for *some* CLEP General or Subject Examinations, provided satisfactory scores are attained. Credits earned under CLEP are not considered as residence credit.

Policies and Administration of the Examinations

These tests are administered at CLEP testing centers throughout the country. Written applications must be completed and on file at the testing center selected, usually not later than three working weeks prior to the intended testing date. The University of Maryland is a CLEP Test Center (Test Center Code 5814), giving tests the third Saturday of the month.

The fees for these examinations are listed on the standard CLEP application form. To obtain an application or additional information, contact Ms. Williams in the Counseling Center, Shoemaker Hall (Room 0106A), or write to the Program Director, College Level Examination Program, Box 1821, Princeton, N.J. 08540.

Students who desire to earn credit through CLEP must have their official score reports sent to the Office of Admissions, North Administration Building, The University of Maryland, College Park 20742.

A student must matriculate at College Park before requesting the posting of CLEP credits. Such posting will not be done until a student has established a transcript, i.e., earned credit through regularly taken courses. Each campus of the University establishes standards for acceptance of CLEP and AP exemptions and credits. Students must check with the campus to which they will transfer to learn if they will lose, maintain or gain credit.

The College Park Campus will award credit for a CLEP examination provided the examination was being accepted for credit on this campus on the date the examination was taken by the student.

Credit will not be given for *both* completing a course and passing an examination covering substantially the same material.

CLEP examinations posted on transcripts from other institutions will be accepted if the examination has been approved by the College Park Campus and the scores reported are equal to or greater than those required by this campus. If the transcript from the prior institution does not carry the scores, it will be the responsibility of the student to request the Educational Testing Service to forward a copy of the official report to the Office of Admissions.

The College Park Campus CLEP Advisor is Dr. Helen Clarke. Telephone 454–2731.

General Examinations

Examination	*Minimum Score*	*Crs. Awd.*
English Composition—Acceptable for ENGL 101 (if taken prior to 7/1/77), ENGL 102 (if taken between 7/1/77 & 7/1/78) *Not acceptable after 7/1/78*	489	3
Natural Science—Acceptable for general science credit, no specific course	489	6
Mathematics—Acceptable for general math credit (if taken prior to 9/1/77) *Not acceptable after 9/1/77*	497	3
Humanities	489	6
Sub Scores •		
Fine Arts—Acceptable for ARTH 100 (if taken prior to 9/1/79) *Not acceptable after 9/1/79*	(50)	(3)
Literature—Acceptable for general English credit, no specific course	(50)	(3)
Social Science History	488	6
Sub Scores •		
Social Sciences—Acceptable for general social science credit	(50)	(3)

History—Acceptable for general history credit (if taken prior to 12/31/79) *Not acceptable after 12/31/79*	(50)	(3)

• Sub scores will be used in approving 3 credits when only one test is acceptable

Subject Examinations

Examination [and Related Course(s)]	*Minimum Score*	*Crs. Awd.*
American Government (None)	50	3
Analysis and Interpretation of Literature (ENGL 102)	51	3
Biology, General (ZOOL 101)	49	6
Calculus and Elementary Functions (MATH 140)	50	6
Chemistry, General (CHEM 103)	48	6
College Algebra (None)	49	3
College Algebra—Trigonometry (MATH 115)	49	3
College Composition, with essay questions (ENGL 101)	51	3
Introductory Macroeconomics (ECON 201)	50	3
Introductory Microeconomics (ECON 203)	50	3
Introductory Micro- and Macroeconomics (ECON 205)	49	3
Introductory Sociology (SOCY 100)	51	6
Psychology, General (PSYC 100)	50	3
Trigonometry (None)	50	3

Departmental Proficiency Examinations (Credit by Examination). College Park Departmental Proficiency Examinations, customarily referred to as "credit-by-examination", are offered in a number of University courses, and are comparable to comprehensive final examinations in those courses. These examinations are given at a time mutually agreed upon by the student and the department. Department offices will provide information regarding place and administration, type of examination, and material which might be helpful in preparing for examinations.

An undergraduate who passes a departmental proficiency examination is given credit and quality points toward graduation in the amount regularly allowed in the course, provided such credits do not duplicate credit obtained by some other means (e.g., earned in high school or another collegiate institution).

Although the mathematics and foreign language departments receive the most applications for credit-by-examination, most departments will provide examinations for a number of their courses. Any student who wishes more information or to apply for an examination should see the Director of Special Advising Programs, Room 3151, Hornbake Library.

Policies

The applicant must be formally admitted to the College Park Campus. Posting of credit, however, will be delayed until the student is registered.

Departmental Proficiency Examinations may not be taken for courses in which the student has been registered beyond the schedule adjustment period (the first 10 days of classes).

Departmental Proficiency Examinations may not be used to change grades, including incompletes.

Application for credit-by-examination is equivalent to registration for a course, however, the following conditions apply:

a. A student may cancel the application at any time prior to completion of the examination with no entry on his/her permanent record. (Equivalent to the schedule adjustment period.)
b. The instructor makes the results of the examination available to the student prior to formal submission of the grade. Before formal submission of the grade, a student may elect not to have this grade recorded. In this case, a symbol of W is recorded. (Equivalent to the drop procedure.)
c. No course may be attempted more than twice.
d. The instructor must certify on the report of the examination submitted to the Registrations Office that copies of the examination questions or identifying information in the case of standardized examinations, and the student's answers have been filed with the chairman of the department offering the course.

Letter grades earned on examinations to establish credit, if accepted by the student, are entered on the student's transcript and used in computing his/her cumulative grade point average. A student may elect to take an examination for credit on a "Pass-Fail" basis under the normal "Pass-Fail" regulations.

Academic Dishonesty

Academic dishonesty is prohibited by the *Code of Student Conduct* and may result in a severe sanction, including expulsion from the University. The *Code* defines academic dishonesty as follows:

a. *Cheating.* Intentionally using or attempting to use unauthorized materials, information or study aids in any academic exercise.
b. *Fabrication.* Intentional and unauthorized falsification or invention of any information or citation in an academic exercise.
c. *Facilitating Academic Dishonesty.* Intentionally or knowingly helping or attempting to help another to commit an act of academic dishonesty.
d. *Plagiarism.* Intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise.

In cases involving charges of academic dishonesty, the instructor in the course or person in charge of the activity shall report to the instructional department chairperson or dean (if there is no chairperson) any information received and the facts within his or her knowledge. If the chairperson of the instructional department determines that there is any sound reason for believing that academic dishonesty may be involved, he or she shall refer the matter to the dean or provost. The dean or provost will then confer with the student's dean or provost and will check the Judiciary Office records to determine if the student has any record of prior offenses involving academic dishonesty. The dean or provost will then consult with the student involved, and if the alleged academic dishonesty is admitted by the student and is his first offense of this nature, the dean or provost may authorize the department chairperson to resolve the charges, provided the penalty is accepted by the student in writing. In such case the department chairperson will make a written report of the matter, including the action taken, to the student's dean or provost and to the Judiciary Office.

If the case is not resolved in the above manner, the dean or provost of the instructional department will appoint an ad hoc Committee of Academic Dishonesty. The Committee will consist of one member from the faculty of the college or division administered by the dean or provost as chairperson, one undergraduate student, and one member from the faculty of the student's college or division appointed by the dean of that college or provost of the division. If the student's dean or provost and the dean or provost administering the instructional department are the same, a second member of the faculty of the college or division concerned is appointed. If within jurisdiction of the Dean for Undergraduate Studies that Dean will appoint the ad hoc Committee on Academic Dishonesty consisting of two faculty having experience in the General Studies Program, one serving as chairperson, and one student in that program.

The dean or provost of the instructional department will refer the specific report of alleged academic dishonesty to this ad hoc committee and the committee will hear the case. The hearing procedures before this committee will in general conform to those required for student judicial boards. The *Code of Student Conduct* provides that any act of academic dishonesty, including a first offense, will place the student in jeopardy of "suspension from the University, unless specific and significant mitigating factors are present" (part eleven). A repeated violation, or the more serious first offense, may result in expulsion. Also, disciplinary records for any act of academic dishonesty are retained in the Judicial Programs Office for at least three years from the date of final adjudication.

The chairman of the committee will report its actions to the dean or provost, the student's dean or provost, and to the Judiciary Office. The dean or provost of the instructional department will advise the student in writing of the disciplinary action of the committee and, if it has been determined that the student should be suspended or expelled, advise the student of the right to file an appeal, in accordance with Parts 38 and 40 through 45 of the *Code of Student Conduct*.

Students accused of academic dishonesty should request a copy of the University document "Preparing for an Academic Dishonesty Hearing". Contact the Judicial Programs Office at 454–2927.

TO REPORT ACADEMIC DISHONESTY, DIAL 454–4746 AND ASK FOR THE "CAMPUS ADVOCATE".

3 Academic Divisions and Campus-wide Programs

Division of Agricultural and Life Sciences

Provost: Miller

The Division of Agricultural and Life Sciences offers educational opportunities for students in subject matter relating to living organisms and their interaction with one another and with the environment. Education in all aspects of agriculture is included. Programs of study include those involving the most fundamental concepts of biological science and chemistry and the use of knowledge in daily life as well as the application of economic and engineering principles in planning the improvement of life. In addition to pursuing the baccalaureate degree, a number of students in this Division engage in preprofessional education in such fields as pre-medicine, pre-dentistry, and pre-veterinary medicine.

The student may obtain a Bachelor of Science degree with a major in any of the departments and curricula listed. Students in preprofessional programs may, under certain circumstances, obtain a B S degree following three years on campus and one successful year in a professional school.

Structure of the Division. The Division of Agricultural and Life Sciences includes the following departments and programs:

1. Within the College of Agriculture:
   a. Departments: Agricultural Engineering, Agricultural and Extension Education, Agricultural and Resource Economics, Agronomy, Animal Sciences, Horticulture, and Poultry Science.
   b. Programs or Curricula: agricultural chemistry, animal sciences, food science, general agriculture, natural resources management, and pre-forestry.
   c. Institute of Applied Agriculture.
2. Divisional Units:
   a. Departments: Botany, Chemistry, Entomology, Geology, Microbiology, Zoology.
   b. Programs or Curricula: biochemistry, general biological sciences.

Admission. Requirements for admission to the Division are the same as those for admission to the other units of the University. Application must be made to the Director of Admissions, The University of Maryland, College Park, Maryland 20742.

Students desiring a program of study in the Division of Agricultural and Life Sciences should include the following subjects in their high school program: English, four units; college preparatory mathematics (algebra, plane geometry), three or four units, biological and physical sciences, two units; history and social sciences, one unit.

Students wishing to major in chemistry, botany, microbiology, or zoology, or to follow a pre-medical or pre-dental program, should include four units of college preparatory mathematics (algebra, plane geometry, trigonometry, and more advanced mathematics, if available). They should also include chemistry and physics.

A faculty advisor will be designated to help select and design a program of courses to meet the needs and objectives of each entering student. As soon as a student selects a major field of study, an advisor representing that department or program will be assigned. All students are urged to see their advisor at least once each semester.

Students following preprofessional programs will be advised by knowledgeable faculty.

In addition to the educational resources on the campus, students with specific interests have an opportunity to utilize libraries and other resources of the several government agencies located close to the campus. Research laboratories related to agriculture or marine biology are available to students with special interests.

Degree Requirements. Students graduating from the Division must complete at least 120 credits with an average of 2.0 in all courses applicable towards the degree. Included in the 120 credits must be the following:

1. University Studies Program Requirements (40 credits).
2. Division Requirements:
   a. Chemistry: Any one course of three or more credits in chemistry numbered 102 or higher.
   b. Mathematics or any course that satisfies the University Studies Program.
   c. Biological Sciences: Any one course carrying three or more credits selected from offerings of the Departments of Botany, Entomology, Microbiology or Zoology, or any interdepartmental course approved for this purpose by the Division.
3. Requirements of the major and supporting areas, which are listed under individual program headings.

Honors Programs. Students may apply for admission to the honors programs of Agricultural and Resource Economics, Botany, Chemistry, General Biological Sciences, Microbiology, and Zoology.

On the basis of the student's performance during participation in the Honors Program, the department may recommend the candidates for the appropriate degree with (departmental) honors, or for the appropriate degree with (departmental) high honors. Successful completion of the Honors Program will be recognized by a citation in the Commencement Program and by an appropriate entry on the student's record and diploma.

College of Agriculture

Dean: Hegwood

The College of Agriculture offers educational programs with a broad cultural and scientific base. Students are prepared for careers in agriculturally related sciences, technology and business.

The application of knowledge to the solution of some of the world's most critical problems concerning adequate amounts and quality of food and the quality of the environment in which we live are important missions of the College.

This original College of The University of Maryland College Park was chartered in 1856. The College of Agriculture has a continuous record of leadership in education since that date. It became the beneficiary of the Land-Grant Act of 1862.

The College of Agriculture continues to grow and develop as part of the greater University, providing education and research activities enabling us to use our environment and natural resources to best advantage while conserving basic resources for future generations.

Advantage of Location and Facilities. Educational opportunities in the College of Agriculture are enhanced by the nearby location of several research units of the federal government. Of particular interest are the Agricultural Research Center at Beltsville and the U.S. Department of Agriculture Headquarters in Washington, D.C. The National Agricultural Library at Beltsville is an important resource.

Related research laboratories of the National Institutes of Health, military hospitals, National Aeronautics and Space Agency, and the National Bureau of Standards are in the vicinity. Interaction of faculty and students with personnel from these agencies is encouraged. Teaching and research activities are conducted with the cooperation of scientists and professional people in government positions.

Instruction in the basic biological and physical sciences, social sciences and engineering principles is conducted in well-designed classrooms and laboratories. The application of basic principles to practical situations is demonstrated for the student in numerous ways.

Modern greenhouses are available for teaching and research on a wide variety of plants, plant pests, and crop cultural systems.

Herds of dairy and beef cattle and flocks of poultry are kept on the campus for teaching and research purposes.

Several operating research farms, located in Central, Western and Southern Maryland and on the Eastern Shore, support the educational programs in agriculture by providing locations where important crops, animals and poultry can be grown and maintained under practical and research conditions. These farms add an important dimension to the courses offered in agriculture. Data from these operations and from cooperating producers and processors of agricultural products are utilized by students interested in economics, teaching, engineering, and conservation, as they relate to agriculture, as well as by those concerned with biology or management of agricultural crops and animals.

General Information. Today's agriculture is a highly complex and extremely efficient industry which includes supplies and services used in agricultural production and the marketing, processing and distribution of products to meet the consumers' needs and wants. The College of Agriculture strives to accomplish the task of providing an agricultural education that fits all the

needs of today's most advanced science of agriculture

Instruction in the College of Agriculture includes the fundamental sciences and emphasizes the precise knowledge that graduates must employ in the industrialized agriculture of today, and helps develop the foundation for their role in the future. Course programs in specialized areas may be tailored to fit the particular needs of the individual student.

Previous training in agriculture is not a prerequisite for study in the College of Agriculture; students with rural, suburban and urban backgrounds comprise the student body.

Graduates of the College of Agriculture have an adequate educational background for careers and continued learning after college in business, production, teaching, research, extension, and many other professional fields.

Requirements for Admission. Admission requirements to the College of Agriculture are the same as those of the University.

For students entering the College of Agriculture it is recommended that their high school preparatory course include English, 4 units; mathematics, 3 units; biological and physical sciences, 3 units; and history or social sciences, 2 units. Four units of mathematics should be elected by students who plan to major in agricultural engineering or agricultural chemistry.

Requirements for Graduation. Each student must complete at least 120 credit hours in academic subjects with a minimum grade point average of 2.0(C).

Honors Program. An Honors Program is approved for majors in agricultural and resource economics. The objective of the Honors Program is to recognize superior scholarship and to provide opportunity for the excellent student to broaden his or her perspective and to increase the depth of his or her studies.

The programs in honors are administered by Departmental Honors. Students in the College of Agriculture who are in the top 20 percent of their class at the end of their first year may be considered for admission into the Honors Program. Of this group up to 50 percent may be admitted.

Sophomores or first semester juniors will be considered upon application from those students in the upper 20 percent of their class. While application may be made until the student enters the sixth semester, early entrance into the program is recommended. Students admitted to the program enjoy certain academic privileges.

Faculty Advisement. Each student in the College of Agriculture is assigned to a faculty advisor. Advisors normally work with a limited number of students and are able to give individual guidance.

Students entering the freshman year with a definite choice of curriculum are assigned to departmental advisors for counsel and planning of all academic programs. Students who have not selected a definite curriculum are assigned to a general advisor who assists with the choice of electives and acquaints students with opportunities in the curricula in the College of Agriculture and in other divisions of the University.

Scholarships. A number of scholarships are available for students enrolled in the College of Agriculture. These include awards by the Agricultural Development Fund, American Society of Agricultural Engineers, Arthur M. Ahalt Memorial Scholarship, Capitol Milk Producers Cooperative, Inc., Dr. Ernest N. Cory Trust Fund, Ernest T. Cullen Memorial Scholarship, Dairymen, Inc. Scholarship, Dairy Technology Scholarships and Grants, Delmarva Corn and Soybean Scholarship, Delaware-Maryland Plant Food Association, Mylo S. Downey Memorial Scholarship, James R. Ferguson Memorial Scholarship, Goddard Memorial Scholarship, Manasses J. and Susanna Grove Memorial Scholarship, The Kinghorne Fund, Gary Lee Lake Memorial Scholarship, Maryland Holstein-Freisian Association Scholarship, Maryland Turfgrass Association, Maryland State Golf Association, Maryland and Virginia Milk Producers, Inc., Dr. Ray A. Murray Scholarship Fund, Paul R. Poffenberger Scholarship Fund, R. J. Reynolds Tobacco Scholarship, Ralston Purina Company, J. Homer Remsberg Memorial Scholarship, The Schluderberg Foundation, Southern States Cooperative, Inc., the David N. Steger Scholarship Fund, T. B. Symons Memorial Scholarship, Veterinary Science Scholarship, Winslow Foundation and the Nicholas Brice Worthington Scholarship Fund.

Student Organizations. Students find opportunity for varied expression and growth in the several voluntary organizations sponsored by the College of Agriculture. These organizations are Agriculture and Resource Economics Club, Agronomy Club, American Society of Agricultural Engineers, Animal Husbandry Club, Collegiate 4-H Club, Collegiate Future Farmers of America, Conservation and Forestry Club, Equestrian Association, Food Science Club, Horticultural Club, INAG Club, Poultry Science Club, and Veterinary Science Club.

Alpha Zeta is a national agricultural honor fraternity. Members are chosen from students in the College of Agriculture who have attained the scholastic requirements and displayed leadership in agriculture.

The Agricultural Student Council is made up of representatives from the various student organizations in the College of Agriculture. Its purpose is to coordinate activities of these organizations and to promote work which is beneficial to the college.

Required Courses. Courses required for students in the College of Agriculture are listed in each curriculum. The program of the freshman year is similar for all curricula. Variations in programs will be suggested based on students' interests and test scores.

Typical Freshmen Program—College of Agriculture

	Semester Credit Hours	
	I	*II*
ENGL 101	3	
BOTN 101	4	
MATH	3	3
ANSC 101	3	
ZOOL 101		4
AGRO 100	2	
AGRO 102		2
SPCH 107		3
University Studies Program Requirement		3
Total	16	15

College of Agriculture Departments, Programs and Curricula

Agricultural and Extension Education

Professor and Chairman: Nelson
Professors: Longest, Ryden (Emeritus)
Associate Professors: Cooper, Rivera, Seibel, Smith
Affiliate Associate Professor: Coffindaffer
Assistant Professors: Gibson, Glee
Affiliate Assistant Professor: Booth
Instructor: Sieling

The program is designed to prepare persons to teach agriculture at the secondary or postsecondary levels. It also prepares persons to enter community development and other agriculturally related careers which emphasize working with people.

A degree in agricultural and extension education may lead to career opportunities in educational and developmental programs, public service, business and industry, communications, research, or college teaching.

Students preparing to become teachers of agriculture, including horticulture, agribusiness and other agriculturally related subjects, should have had appropriate experience with the kind of agriculture they plan to teach or should arrange to secure that experience during summers while in college.

Students in the agricultural education curriculum are expected to participate in the Collegiate Chapter of the Future Farmers of America for the purpose of developing skills necessary for advising.

Agricultural and Extension Education Program

	Semester Credit Hours
University Studies Program Requirements	40
AGRO 100—Crops Laboratory	2
AGRO 102—Crop Production or	
AGRO 406—Forage Crop Production (3)	2
AGRO 302—General Soils	4
ANSC 101—Principles of Animal Science	3
ANSC 203—Feeds and Feeding	3
AREC 406—Farm Management or	
AREC 407—Financial Analysis of Farm Business	3
BOTN 101—General Botany	4
BOTN 221—Diseases of Plants	4
CHEM 103, 104—General Chemistry I, Fundamentals of Organic and Biochemistry	4, 4
EDHD 300—Human Development and Learning	6
EDPA 301—Foundations of Education	3
ENAG 100—Basic Agricultural Engineering Technology	3
ENAG 200—Introduction to Farm Mechanics	2
ENAG 305—Farm Mechanics	2
ENTM 252—Agricultural Insect Pests	3
HORT 222—Vegetable Production or	
HORT 231—Greenhouse Management or	
HORT 271—Plant Propagation	3
MATH 110—Introduction Mathematics I	3
AEED 302—Introduction to Agricultural Education	2
AEED 303—Teaching Materials and Demonstrations	2
AEED 305—Teaching Young and Adult Farmer Groups	1
AEED 311—Teaching Secondary Vocational Agriculture	3
AEED 313—Student Teaching	5
AEED 315—Student Teaching	3
AEED 398—Seminar in Agricultural Education	1
AEED 464—Rural Life in Modern Society	3
SPCH 107—Technical Speech Communication	3
ZOOL 101—General Zoology	4
Electives	6

Agricultural and Resource Economics

Professor and Chairman: Hueth
Professors: Brown, Cain, Chambers, Curtis (Emeritus), Foster, Gardner, Just, Lessley, Moore, Norton, Poffenberger (Emeritus), Stevens, Tuthill, Wysong
Associate Professors: Bockstael, Chern (Affiliate), Hamilton (Emeritus), Hardie, Lawrence, Lopez, McConnell, Strand
Assistant Professors: Favero (Affiliate), Ganguly (Adjunct), Levins, Phipps
Principal Specialists: Beiter, Crothers
Instructor: Dagher

The curriculum combines training in the business, economics and international aspects of agricultural production and marketing and natural resource use with the biological and physical sciences. Programs are available for students in several areas. Students desiring to enter agricultural marketing or business affiliated with agriculture may elect the agricultural business option, and those interested in foreign service may elect the international agriculture option. Students primarily interested in the broad aspects of production and management in the agricultural sector may elect the agricultural economics option. Those interested in training in resource management and evaluation may elect the resource economics option.

In these programs, students are trained for employment in agricultural business firms, for positions in sales or management, for local, state, or federal agencies, for extension work, for research, and for farm operation or management.

Courses for the freshman and sophomore years are essentially the same for all students. However, freshmen and sophomores are encouraged to fulfill the math and business requirements in their first two years. In the junior year the student selects the option of his or her choice. Courses in this department are designed to provide training in the application of economic principles to the production, processing, distribution, and merchandising of agricultural products and the effective management of our natural and human resources. The curriculum includes courses in general agricultural economics, marketing, farm management, prices, resource economics, agricultural policy, and international agricultural economics.

	Semester Credit Hours
University Studies Program Requirements*	39
Biological Sciences	3
Chemistry	3
AREC 250—Elements of Agricultural and Resource Economics	3
AREC 404—Prices of Agricultural Products	3
AREC 405—Economics of Agricultural Production	3
AREC 427—Marketing Agricultural Products	3
AREC 484—Introduction to Econometrics in Agriculture	3
BMGT 220—Principles of Accounting	3
CMSC 103—Introduction to Computing	3
ECON 201—Principles of Economics I	3
ECON 203—Principles of Economics II	3
ECON 401—National Income Analysis	3
ECON 403—Intermediate Price Theory	3
MATH 110—Introduction to Mathematics I	3
MATH 111—Introduction to Mathematics II	3
MATH 220—Elementary Calculus	3
Statistics**	3
Technical Agriculture**	9

* 12 credits may also satisfy departmental requirements

** Specific courses must be selected in consultation with the student's advisor

Agribusiness Option

Each student must take the following or the equivalent:	
AREC 306—Farm Management	3
AREC 407—Agricultural Finance	3
AREC 414—Agribusiness Management	3
BMGT 340—Business Finance	3
BMGT 350—Marketing Principles	3
BMGT 364—Management and Organization Theory	3
BMGT 380—Business Law	3

Agricultural Economics Option

Each student must take the following or the equivalent:	
AREC 306—Farm Management	3
AREC 407—Agricultural Finance	3
ECON 425—Mathematical Economics	3
Other courses in Agricultural Economics Option	6

International Agriculture Option

Each student must take the following or the equivalent:	
AREC 445—World Agricultural Development and the Quality of Life	3
ECON 440—International Economics	3
Other courses in International Agriculture Option	12
Language Requirements	6

Resource Economics Option

Each student must take the following or the equivalent:	
AREC 453—Economic Analysis of Natural Resources	3
ECON 425—Mathematical Economics	3
Other courses in Resource Economics Option	15

Course Code Prefix—AREC

Agricultural Chemistry

This curriculum combines the fundamentals of chemistry with flexibility through electives to prepare the student for graduate work in agricultural and life sciences programs, technical work in government and private research and quality control laboratories, and production and sales work in specialized chemical industries and food production and processing industries.

Program revisions are under consideration. Each student should see an advisor.

	Semester Credit Hours
University Studies Program Requirements*	30
Major Requirements:	
CHEM 103—General Chemistry I or CHEM 105	4
CHEM 113—General Chemistry II or CHEM 115	4
CHEM 233—Organic Chemistry I or CHEM 235	4
CHEM 243—Organic Chemistry II or CHEM 245	4
CHEM 321—Quantitative Analysis	4
Eight Credits from the Following Courses:	
AGRO 302—General Soils	4
BOTN 221—Plant Pathology	4
ENTM 204—General Entomology	4
GEOL 100—Physical Geology	3
GEOL 110—Physical Geology Laboratory	1
Additional Requirements:	
MATH 140—Analysis I	4
MATH 141—Analysis II	4
PHYS 141—Principles of Physics	4
PHYS 142—Principles of Physics	4
Electives in Biology	6
Approved Agricultural Electives, chosen from the following: any 400 level courses in CHEM or BCHM, FDSC 421 or 423, or ENTM 452*	12
Electives**	28

* These courses should be selected after consultation with the Agricultural Chemistry Advisor. The advisor may approve other courses, in special cases, to meet the career objectives of the student.

** Six to ten of the elective credits must be for upper-division courses to meet the curriculum requirement of 35 credits of total upper-division work.

Course Code Prefix—CHEM

Agricultural Engineering

Chairman: Stewart
Professors: Felton (Emeritus), Green (Emeritus), Harris, Krewatch (Emeritus), Wheaton
Associate Professors: Grant, Johnson, Merrick (Emeritus), Ross, Stewart
Assistant Professors: Magette, Muller
Instructors: Carr, Gird, Hochheimer, Smith
Visiting Professor: Yeck
Adjunct Assistant Professor: Sager
Affiliate Assistant Professor: Brinsfield
Principal Specialist: Brodie

Agricultural engineering utilizes both the physical and biological sciences to help meet the needs of our increasing world population for food, natural fiber and improvement or maintenance of the environment. Scientific and engineering principles are applied to the conservation and utilization of soil and water resources for food production and recreation, to the utilization of energy to improve labor efficiency and to reduce laborious and menial tasks, to the design of structures and equipment for housing or handling of plants and animals to optimize growth potential, to the design of residences to improve the standard of living for the rural population, to the development of methods and equipment to maintain or increase the quality of food and natural fiber, to the flow of supplies and equipment to the agricultural and aquacultural production units, and to the flow of products from the production units and the processing plants to the consumer. Agricultural engineers place emphasis on maintaining a high quality environment as they work toward developing efficient and economical engineering solutions.

The undergraduate curriculum provides opportunity to prepare for many interesting and challenging careers in design, management, research, education, sales, consulting or international service. The program of study includes a broad base of mathematics, physical and engineering sciences combined with basic biological sciences. Twenty-two hours of electives give flexibility so that a student may plan a program according to his major interest.

	Semester	
Freshman Year	*I*	*II*
MATH 140, 141—Analysis I, II	4	4
CHEM 103, 104*—General Chemistry I, Fundamentals of Organic and Biochemistry	4	4
BOTN 101 or ZOOL 101	4	
ENES 101—Intro. Engineering Science	3	
ENES 110—Statics		3

PHYS 161—General Physics I		3
University Studies Program Requirements**	3	3
Total	18	17
Sophomore Year		
MATH 241—Analysis III	4	
MATH 246—Differential Equations for Scientists & Engineers		3
PHYS 262, 263—General Physics	4	4
ENES 220—Mechanics of Materials	3	
ENES 221—Dynamics		3
ENME 217—Thermodynamics		3
Free Elective	3	
University Studies Program Requirements**	3	3
Total	17	16
Junior Year		
ENME 300 (or ENCE 300)—Materials Science & Engineering	3	
ENME 342 (or ENCE 330)—Fluid Mechanics	3	
ENEE 300—Principles of Electrical Engineering		3
ENCE 350—Structural Analysis	3	
ENAG 454—Biological Process Engineering		4
Technical Electives***	4	6
University Studies Program Requirements**	3	3
Total	16	16
Senior Year		
ENAG 421—Power Systems	3	
ENAG 444—Functional Design of Machines and Equipment		3
ENAG 422—Soil and Water Engineering	3	
ENAG 424—Functional and Environmental Design of Agricultural Structures		3
Technical Electives***	3	3
Free Electives	3	
University Studies Program Requirements**	3	6
Total	15	15

Minimum Degree Credits—103 + 27 U S P.

* CHEM 113 may be substituted for CHEM 104.

** Approved and required University Studies Program courses are listed in the Schedule of Classes each semester. Students should consult with departmental advisor to ensure selection of courses to meet program requirements. Agricultural engineering students are exempt from ENGL 391, 393. Students matriculating before May 1980 must meet General University Requirements and should consult departmental advisors for proper course selection.

*** Technical electives, 16 credits, related to field of concentration, must be selected from a departmentally approved list. Nine credits must be 300 level and above.

Course Code Prefix—ENAG

Agriculture—General Curriculum

The General Agriculture curriculum provides for the development of a broad understanding in agriculture.

The flexibility of this curriculum permits selection of electives that will meet individual career plans in agriculture and agriculturally related business and industry.

Students will be encouraged to obtain summer positions which will give them technical laboratory or field experience in their chosen interest area.

	Semester Credit Hours
University Studies Program Requirements*	30
BOTN 101—General Botany*	4
ZOOL 101—General Zoology*	4
CHEM 103—General Chemistry I	4
CHEM 104—Fundamentals of Organic and Biochemistry or CHEM 113—General Chemistry II	4
MATH 110 level or higher*	3
ENAG 100—Basic Agricultural Engineering Technology	3
ENAG 200—Introduction to Farm Mechanics	2
AGRO 100—Crop Production Laboratory	2
AGRO 302—General Soils	4
ANSC 101—Principles of Animal Science	3
ANSC 203—Feeds and Feeding	3
ANSC or AGRO —**	3
AREC 250—Elements of Agricultural and Resource Economics	3
AREC —**	3
BOTN 221—Diseases of Plants or ANSC 412—Introduction to Diseases of Animals	4
ENTM 252—Agricultural Insect Pests	3
HORT —**	3
AEED 464—Rural Life in Modern Society	3
Community Development Related, Non-agricultural Life Science, Biometrics, Computer Science, or Accounting	6
Electives (18 credit hours 300 or above)	23–24

* includes 11 required credits listed below

** Student may select any course(s) having required hours in the department indicated

Agronomy

Professor and Acting Chairman: Aycock

Professors: Bandel, Clark (Emeritus), Decker, Fanning, Hoyert (Emeritus), Kuhn (Emeritus), McKee, Miller (Emeritus), Street (Emeritus)

Associate Professors: Kenworthy, McIntosh, Mulchi, Sammons, Turner, Vough, Weil, Weismiller

Assistant Professors: Angle, Bruns, Caldwell, Dernoeden, Glenn, Hill, Rabenhorst, Ritter, Thomison, Welterlen

Adjunct Professor: Meisinger

Agronomy instruction combines the principles of basic sciences with an intimate knowledge of plants and soils. This amalgamation of basic and applied sciences provides the basis for improved programs to conserve soil resources and improve environmental quality while providing programs for improved crop production to meet the ever increasing need for food.

The agronomy curricula are flexible and allow the student either to concentrate on basic science courses that are needed for graduate work or to select courses that prepare for employment at the bachelor's degree level as a specialist with park and planning commissions, road commissions, extension service, soil conservation service, and other governmental agencies. Many graduates with the bachelor's degree are also employed by private corporations such as golf courses and seed, fertilizer, chemical, and farm equipment companies.

Agronomy students who follow the Journalism-Science Communication option are prepared to enter the field of science communication. Opportunities in this area are challenging and diverse. Students who are interested in public relations may find employment with industry or governmental agencies. Others may become writers and, in some cases, science editors for newspapers, publishing houses, radio, and television. Technical and professional journals hire students trained in this field as editors and writers. Also, this training is valuable to students who find employment in University extension programs, as a large part of their work involves written communication with the public.

Students completing graduate programs are prepared for college teaching and research, or research and management positions with industry and governmental agencies.

Additional information on opportunities in agronomy may be obtained by writing to the Department of Agronomy.

Agronomy Curricula

University Studies Program Requirements (39 semester hours) math and science requirements (9 hours) are satisfied by departmental requirements.

Department Requirements (31 semester hours)

	Semester Credit Hours
All Agronomy students must have a total of at least 40 hours of upper level (300 or 400) courses in the 120 hours approved for graduation. These 40 hours may include upper level courses taken to satisfy part of the University Studies Program Requirement.	
AGRO 100—Crops Laboratory	2
AGRO 102—Crop Production	2
AGRO 302—General Soils	4
AGRO 398—Senior Seminar	1
BOTN 101—General Botany	4
CHEM 103—General Chemistry I	4
CHEM 104—Fundamentals of Organic and Biochemistry*	4
MATH 110—Introduction to Mathematics or	3
MATH 115—Pre-calculus (consult advisor)	3
PHYS 121—Fundamentals of Physics I	4
SPCH 100—Basic Principles of Speech Communication or	
SPCH 107—Technical Speech Communication	3

* Students intending to take additional chemistry should substitute CHEM 113, followed by CHEM 233 and CHEM 243.

Crop Science Curriculum

University and departmental requirements	61
AGRO —Advanced Crops Courses (Consult Adviser)	8
AGRO —Advanced Soils Courses (Consult Adviser)	6
BOTN 441—Plant Physiology	4
One of the following:	3–4
BOTN 212—Plant Taxonomy (4)	
BOTN 414—Plant Genetics (3)	
BOTN 416—Principles of Plant Anatomy (4)	
Electives	37–38

Soil Science Curriculum

University and departmental requirements	61
AGRO —Advanced Soils Courses (Consult Adviser)	3
AGRO —Advanced Crops Courses (Consult Adviser)	6

AGRO 414—Soil Classification and Geography	4
AGRO 417—Soil Physics	3
AGRO 421—Soil Chemistry	3
GEOL 100—Introduction to Physical Geology	3
MICB 200—General Microbiology	4
Electives	33

Turf and Urban Agronomy Curriculum

University and Departmental Requirements	61
AGRO 411—Soil Fertility Principles	3
AGRO 405—Turf Management	3
AGRO 453—Weed Control	3
BOTN 441—Plant Physiology	4
BOTN 425—Diseases of Ornamentals and Turf*	2
ENTM 453—Insect Pests of Ornamentals and Turf*	3
HORT 160—Introduction to the Art of Landscaping*	3
AGRO 415—Soil Survey and Land Use	3
Electives (HORT 453, HORT 454, and RECR 495 suggested)	35

* BOTN 221, ENTM 204, and BOTN 212 serve as prerequisites.

Conservation of Soil, Water and Environment Curriculum

University and Departmental Requirements	61
AGRO 417—Soil Physics or	
AGRO 421—Soil Chemistry	3
AGRO 413—Soil and Water Conservation	3
AGRO 411—Soil Fertility Principles	3
AGRO 414—Soil Classification and Geography	4
AGRO 415—Soil Survey and Land Use	3
AGRO 423—Soil-Water Pollution	3
AGRO —Advanced Crops Courses (Consult Adviser)	5–6
Select one of the following courses:	3
BOTN 211—Principles of Conservation (3)	
GEOG 445—Climatology (3)	
AREC 432—Introduction to Natural Resources Policy (3)	
Electives	31–32

Journalism-Science Communication Option

A student following this option in the crop science or soil science curriculum must elect journalism and basic science and math courses in addition to the required curriculum courses. Many combinations will be acceptable. The adviser can aid in helping the student plan an appropriate program.

Course Code Prefix—AGRO

Animal Sciences

Department of Animal Sciences

Professor and Chairman: Westhoff
Professors: Arbuckle (Emeritus), Flyger, Foster (Emeritus), Green (Emeritus), Leffel (Emeritus), Mather, Vandersall, Vijay, Williams, Young
Associate Professors: DeBarthe, Douglass, Erdman, Goodwin, Hartsock, Majeskie, Russek, Stricklin
Assistant Professors: Alston-Mills, Barao, Cassel, Frank, Hudson, Leighton, Marshall, Peters, Varner
Principal Specialist: Morris (Emeritus)
Associate Specialist: Curry

Department of Poultry Science

Professor and Chairman: Thomas
Professors: Heath, Kuenzel, Shorb (Emerita), Soares
Associate Professors: Doerr, Johnson, Ottinger, Quigley (Emeritus), Wabeck
Assistant Professor: Mench
Adjunct Assistant Professor: Augustine

The curriculum in animal sciences offers a broad background in general education, basic sciences, and agricultural sciences, and the opportunity for students to emphasize that phase of animal agriculture in which they are specifically interested. Each student will be assigned to an advisor according to the program he or she plans to pursue.

Curriculum requirements in animal sciences can be completed through the Departments of Animal Sciences or Poultry Science. Programs of elective courses can be developed which provide major emphasis on beef cattle, sheep, swine or horses, dairy or poultry. Each student is expected to develop a program of electives in consultation with an advisor by the beginning of the junior year.

Objectives. The following specific objectives have been established for the program in animal sciences:

1. To acquaint students with the role of animal agriculture in our cultural heritage.
2. To prepare students for careers in the field of animal agriculture. These include positions of management and technology associated with animal, dairy, or poultry production enterprises, positions with marketing and processing organizations, and positions in other allied fields, such as feed, agricultural chemicals and equipment firms.
3. To prepare students for entrance to veterinary schools.
4. To prepare students for graduate study and subsequent careers in teaching, research and extension, both public and private.
5. To provide essential courses for the support of other academic programs of the University.

Required of All Students

	Semester Credit Hours
University Studies Program Requirements*	40
ANSC 101—Principles of Animal Science	3
FDSC 111—Contemporary Food Industry and Consumerism	3
ANSC 201—Basic Principles of Animal Genetics	3
ANSC 211—Anatomy of Domestic Animals	4
ANSC 212—Applied Animal Physiology	3
ANSC 214—Applied Animal Physiology Laboratory	1
ANSC 401—Fundamentals of Nutrition	3
ANSC 412—Introduction to Diseases of Animals	3
CHEM 103—General Chemistry I	4
CHEM 104—Fundamentals of Organic and Biochemistry	4
MICB 200—General Microbiology	4
ZOOL 101—General Zoology	4
SPCH 107—Public Speaking	3
Two of the Following:	
ANSC 221—Fundamentals of Animal Production	3
ANSC 242—Dairy Production	3
ANSC 262—Commercial Poultry Management	3
One of the Following	
ENAG 100—Basic Agricultural Engineering Technology	3
CHEM 233—Organic Chemistry I***	4
MATH 111—Introduction to Mathematics II	3
PHYS 121—Fundamentals of Physics I	4
**Electives	39–40

* includes 11 required credits listed below

** electives must include at least twelve credits in upper-division courses in animal science.

*** CHEM 113 or 115 is a prerequisite.

Course Code Prefix—ANSC

Food Science Program

Professor and Coordinator: Wiley (Horticulture)
Professors: Wheaton (Agricultural Engineering); Arbuckle *Emeritus*, Keeney (Chemistry), Vijay, Westhoff (Animal Sciences), Bean (Botany), Quebedeaux, Twigg *Emeritus*, Solomos (Horticulture), Heath (Poultry Science)
Associate Professors: Stewart (Agricultural Engineering), Schlimme (Horticulture), Doerr (Poultry Science), Chai (UMCEES)
Assistant Professors: J. Marshall (Animal Sciences); Choi (Food, Nutrition and Institution Management)
Lecturers: Bednarczyk, C. Marshall, Park, Solomon, Weeks
Visiting Professor: Malevski

Food science is a relatively new branch of science concerned with the application of the fundamental principles of the physical, biological and behavioral sciences and engineering to better understand the complex and heterogeneous materials recognized as food. The contemporary food industry is highly dependent on this accumulating body of knowledge and especially on the people who are able to apply it — the food scientists or the food technologists, terms that are used interchangeably.

Courses include the general areas of production, distribution, preparation, evaluation and utilization of foods in order to provide a better and more plentiful food supply for mankind.

Specialization is offered in the areas of flavor and food chemistry, food microbiology, including industrial fermentation, food processing technology including freezing, thermal and aseptic processing, quality assurance and the commodity areas of red meats, milk and dairy products, fruits and vegetables, poultry and poultry products and seafood products.

Opportunities for careers in food science are available in industry, universities and government. Specific positions for food scientists include product development, production management, quality control and quality assurance, technical sales and service, ingredient management, food engineering, research and teaching.

	Semester Credit Hours
University Studies Program Requirements*	40
Division Requirements	
CHEM 103—General Chemistry I	4
MICB 200—General Microbiology	4
MATH 110 or 115—	3
Curriculum Requirements	
ENGL 393—Technical Writing	3
ENAG 414—Mechanics of Food Processing	4
CHEM 104 or CHEM 233	4
CHEM 113—General Chemistry II	4
FDSC 111—Contemporary Food Industry and Consumerism	3

FDSC 398—Seminar	1
FDSC 412, 413—Principles of Food Processing I, II	3, 3
FDSC 421—Food Chemistry	3
FDSC 422—Food Product Research and Development	3
FDSC 423—Food Chemistry Laboratory	2
FDSC 430—Food Microbiology	2
FDSC 431—Food Quality Control	4
FDSC 434—Food Microbiology Laboratory	2
FDSC 442, 451, 461, 471, 482—Horticulture, Dairy, Poultry, Meat and Seafood Products Processing (2 required)	3, 3
NUTR 100—Elements of Nutrition	3
BCHM 261—Elements of Biochemistry	3
PHYS 121—Fundamentals of Physics	4
Electives	28–29

* includes 11 required credits listed below

Course Code Prefix—FDSC

Horticulture

Professor and Chairman: Quebedeaux
Professors: Gouin, Hegwood, Link (Emeritus), Oliver, Scott (Emeritus), Shanks (Emeritus), Solomos, Stark (Emeritus), Thompson (Emeritus), Twigg (Emeritus), Wiley
Adjunct Professor: Galleta
Visiting Professor: Faust
Associate Professors: Beste, Bouwkamp, Gould, Kundt, McClurg, Ng, Pitt, Schales, Schlimme, Stimart, Swartz, Walsh
Adjunct Associate Professor: Kretchmer
Assistant Professors: Healy, LaSota, Stutte,
Lecturer: Mityga

The horticulturist combines a knowledge of the basic sciences with an intimate knowledge of plants and their requirements in an effort to help meet the food needs of the world population and to help beautify man's surroundings. The horticulturist specifically, is involved with fruit production (pomology), vegetable production (olericulture), greenhouse plant production (floriculture), production of ornamental trees and shrubs, post-harvest horticulture, and the aesthetic and functional planning and design of landscapes for public and private facilities (landscape design). Horticultural principles are essential to designing the landscape for improvement of the human environment. Post-harvest horticulture is involved with the storage and transportation of horticultural products until they reach the consumer.

The curriculum in horticulture prepares students for a future in commercial production of the horticultural crops, and for employment in the horticultural industries such as fruit and vegetable processing, seed production and sales, agricultural chemical sales and service, florist shops and garden centers, and as horticulturists for parks, highway systems, botanic gardens and arboretums.

Majors may prepare for work with handicapped persons as horticultural therapists by electing appropriate courses in the social sciences and in recreation. The horticultural education option is designed for those who wish to teach horticulture in the secondary schools. It prepares the graduate with a basic knowledge of horticulture and includes the courses required for certification to teach in Maryland. The landscape design option introduces the principles and practices of design and prepares the student for work in the area of residential and small-scale landscape design.

Advanced studies in the Department, leading to the M.S. and Ph.D. degrees, are available to outstanding students having a strong horticultural motivation for research, university teaching and/or extension education.

All students should meet with the option advisor before enrolling in courses for the option.

Curriculum in Horticulture

	Semester Credit Hours
University Studies Program Requirements*	39
Departmental Requirements—All Options:	
AGRO 302—General Soils	4
BOTN 101—General Botany	4
BOTN 221—Diseases of Plants	4
BOTN 441—Plant Physiology	4
CHEM 103—General Chemistry I	4
CHEM 104—Fundamentals of Organic and Biochemistry	4
HORT 271—Plant Propagation	3
HORT 398—Seminar	1
MATH 110—Introduction to Mathematics	3

* includes all applicable required credits listed below

Complete the requirements in one of the following options:

Floriculture and Ornamental Horticulture Option:

	Semester Credit Hours
BOTN 212—Plant Taxonomy	4
HORT 132—Garden Management	2
HORT 160—Introduction to the Art of Landscaping	3
HORT 231—Greenhouse Management	3
HORT 260—Basic Landscape Composition	2
HORT 274—Genetics of Cultivated Plants	3
HORT 451—Technology of Ornamentals	3
HORT 453, 454—Woody Plant Materials	3,3
HORT 432—Fundamentals of Greenhouse Crop Production or	
HORT 456—Production and Maintenance of Woody Plants	3
Electives	31

Horticultural Education Option:

AGRO 405—Turf Management	3
BOTN 212—Plant Taxonomy	4
HORT 111—Tree Fruit Production	3
HORT 132—Garden Management	2
HORT 160—Introduction to the Art of Landscaping	3
HORT 222—Vegetable Production	3
HORT 231—Greenhouse Management	3
HORT 260—Basic Landscape Composition	2
HORT 453—Woody Plant Materials	3
EDHD 300—Human Development and Learning	6
EDSF 301—Foundations of Education	3
AEED 302—Introduction to Agricultural Education	2
AEED 303—Teaching Materials and Demonstrations	2
AEED 305—Teaching Young and Adult Farmer Groups	1
AEED 311—Teaching Secondary Vocational Agriculture	3
AEED 313—Student Teaching	5
AEED 315—Student Teaching	1–4
SPCH 107—Technical Speech Communication	3
Electives	4–7

Pomology and Olericulture Option:

ENTM 252—Agricultural Insect Pests	4
HORT 111, 112—Tree Fruit Production	3, 2
HORT 212—Small Fruit Production	3
HORT 222—Vegetable Production	3
HORT 274—Genetics of Cultivated Plants	3
HORT 411—Technology of Fruits	3
HORT 422—Technology of Vegetables	3
HORT 474—Physiology of Maturation and Storage of Horticultural Crops	2
Electives	34

Landscape Design Option:

APDS 101—Fundamentals of Design	3
EDIT 160—Design Illustrating I	2
HORT 160—Introduction to the Art of Landscaping	3
BOTN 212—Plant Taxonomy	4
HORT 260—Basic Landscape Composition	2
HORT 361—Principles in Landscape Design	3
HORT 362—Advanced Landscape Design	3
HORT 364—Landscape Construction	3
HORT 453, 454—Woody Plant Materials	3, 3
Select *one* of the following:	
AGRO 415—Soil Survey and Land Use	3
AGRO 405—Turf Management	3
BOTN 462 and 464—Plant Ecology *and* Plant Ecology Laboratory	2,2
ENTM 453—Insect Pests of Ornamental Plants	3
GEOG 340—Geomorphology	3
Electives	26–27

Course Code Prefix—HORT

Natural Resources Management Program

The responsible development and use of natural resources are essential to the full growth and stability of an economy.

The curriculum in natural resources management is a preprofessional program designed to teach students balanced concepts of the efficient use and judicious management of natural resources. It identifies their role in economic development while maintaining concern for society and the environment, through a comprehensive approach involving natural sciences, economics, and social sciences. It prepares students for careers in technical, administrative, educational, and research work in such areas as water and land use, fish and wildlife management, and other areas of natural resources management. Course options also include preparation for graduate study in any of several areas within the biological and social sciences.

Students will pursue a broad education program and then elect subjects concentrated in one of three management areas of interest: Plant and Wildlife Resource Management, Land and Water Resource Management, or Environmental Education and Park Management.

Basic Curriculum Requirements

	Semester Credit Hours
University Studies Program Requirements*	40
BOTN 101—General Botany	4
ZOOL 101—General Zoology	4
CHEM 103, 113—General Chemistry I, General Chemistry II	8
GEOL 100, 110—Introductory Physical Geology, Physical Geology Laboratory	

OR	
GEOG 201, 211—Geography of Environmental Systems, Geography of Environmental Systems Laboratory	4
AGRO 302—General Soils	4
AREC 240—Environment and Human Ecology	3
MATH 140 or 220—Calculus I or Elementary Calculus I	3–4
BIOM 301—Introduction to Biometrics	3
ECON 201 or 205—Economics	3
AREC 453—Economic Analysis of Natural Reources	3
BOTN 462/464—Plant Ecology and Plant Ecology Laboratory	4
HORT 171—Elements of Forestry	3
MICB 200—General Microbiology	3
PHYS 117—Introduction to Physics	4
ZOOL 212—Ecology, Evolution and Behavior	4
AEED 499G—Principles of Natural Resources Management	3
AGRO 415—Soil Survey and Land Use	3
AREC 432—Introduction to Natural Resource Policy	3
BMGT 360 or 364—Personnel Management or Management and Organization Theory	3
CMSC 103—Introduction to Computing for Non-majors	
OR	
EDCI 487—Introduction to Computers in Instructional Settings	3

* This curriculum includes 12 of the required 40 University Studies Program credits (Distributive Studies Areas "B" and "D").

Management Areas (23 hours)

Plant and Wildlife Resource Management	
Science Area	10
Management Area	10
Related Coursework	3
Land and Water Resource Management	
Science Area	10
Management Area	10
Related Coursework	3
Environmental Education and Park Management	
Science Area	10
Management and Education Area	10
Related Coursework	3

Of the total credits applied toward the degree (120), at least 40 hours must be in upper division (300–400) courses.

Pre-Forestry

The pre-forestry curriculum offers a number of opportunities to the student interested in pursuing a continued education in forestry, conservation-related subjects, or other disciplines related to the biological/ natural life sciences. The curriculum is strongly oriented in the sciences and is composed of foundation courses which transfer rather readily into related curricula at The University of Maryland and other universities. There are approximately fifty other universities which offer accredited undergraduate degrees in forestry.

Pre-forestry students are advised in the Department of Horticulture. The University of Maryland has an agreement with Virginia Polytechnic Institute and State University (VPI/SU) and with West Virginia University (WVU) whereby Maryland residents accepted into forestry programs at VPI/SU or WVU will be eligible for in-state tuition at those universities. The student must remain enrolled in a forestry program. The student may transfer any time from Maryland to VPI/SU or to WVU.

Pre-Forestry Curriculum

	Semester Credit Hours
ENGL 101, 393*	6
BOTN 101	4
CHEM 103, 104	8
ECON 205 or AREC 250	3
HORT 171	3
HORT 489K, 489L	4
MATH 220, 221	6
PHYS 121, 122	8
Social Sciences & Humanities	12
SPCH 100	3
ZOOL 101	4
PHED	4
Total	65

Other suggested courses include: AGRO 302, BOTN 211, BOTN 221, CMSC 103, ENTM 100, ENTM 204, GEOL 100, 120, STAT 100.

* This course can be taken by pre-forestry students in their last semester of the program, although they may not be juniors.

Combined Degree Curriculum—College of Agriculture and Veterinary Medicine

Students enrolled in the College of Agriculture who have completed at least 90 hours, including all University, Division and College requirements, may qualify for the B.S. degree from The University of Maryland, College of Agriculture, upon successful completion in an accredited College of Veterinary Medicine of at least 30 semester hours. It is strongly recommended that the 90 hours include credits in animal science.

Combined Degree Requirements

	Semester Credit Hours
University Studies Program Requirements*	40
ANSC 221—Fundamentals of Animal Production	3
ANSC 211—Anatomy of Domestic Animals	4
ANSC 212—Applied Animal Physiology	4
BOTN 101—General Botany	4
ZOOL 101—General Zoology	4
Mathematics (must include at least 3 credits of Calculus)	6
CHEM 103—General Chemistry I	4
CHEM 113—General Chemistry II	4
CHEM 233—Organic Chemistry I	4
CHEM 243—Organic Chemistry II	4
PHYS 121—Fundamentals of Physics I	4
PHYS 122—Fundamentals of Physics II	4
Electives	10

* includes 11 required credits listed below

Additional information about this program may be obtained from the College of Veterinary Medicine.

Institute of Applied Agriculture—Two-Year Program

The Institute of Applied Agriculture, a two-year college-level program offered as an alternative to the four-year program, prepares students for specific occupations in technical agriculture.

The Institute offers three major programs with twelve specific curriculum options.

I. Business Farming
   - A Farm Production and Management
   - B Agricultural Business Management

II. Ornamental Horticulture
   - A General Ornamental Horticulture
   - B Nursery Management
   - C Garden Center Management
   - D Greenhouse Management
   - E Florist Shop Management
   - F Landscape Management
   - G Interior Plantscaping Management

III. Turfgrass Management
   - A Golf Course Management
   - B Lawn Care Management
   - C Lawn Care Technician (a one-year option)

The *business farming* program develops skills needed for farm operation or for employment in agricultural service and supply business such as feed, seed, fertilizer and machinery companies and farmers' cooperatives.

Options in *ornamental horticulture* prepare students for employment in or management of greenhouses, nurseries, garden centers, florist shops, landscape maintenance companies or interior plantscaping companies.

The *turfgrass management* program concentrates on the technical and management skills needed to work as a golf course superintendent, to work in commercial or residential lawn care companies or in other turfgrass-oriented industries such as parks and cemeteries.

To enhance a student's occupational experience, the Institute requires participation in a Supervised Work Experience program, usually completed before taking second-year courses.

A graduate of the Institute is awarded a Certificate in Agriculture specifying the student's area of specialization. Graduation requires the successful completion of 60 credit hours of a recognized program option, completion of Supervised Work Experience, and a 2.00 cumulative grade point average.

Though designed as a two-year terminal program, the Institute does not restrict continuing education. In general, all Institute courses are transferrable to the UMCP and UMES campuses. The extent to which the courses can be applied to a baccalaureate degree will depend on the individual department in which a student is planning to major.

Courses Basic to All Programs

COMM I-1—Oral Communication*	3
COMM I-2—Written Communication*	3
AGMA I-1—Agricultural Mathematics*	3
BOTN I-1—Introduction to Plant Science*	3
HORT I-5—Diseases of Ornamentals	3
AGRO I-1—Soils and Fertilizers*	3
AGRO I-6—Weed Control	2

AGRO I-6A—Weed Control Laboratory 1
AGRO I-11—Pesticide Use and Safety 2
AGEN I-1—Agricultural Mechanics I, II 2, 2
AGEN I-2—Power and Machinery 3
AGEN I-3A—Land Measurement and Surveying 1
AGEN I-3B—Drainage Practices 1
AGEN I-3C—Irrigation Practices 1
AGEN I-7—Machine Operation Laboratory 1
AGEC I-2—Business Law* 3
AGEC I-4—Business Operations* 3
AGEC I-8—Using Computers in Agriculture 1
AGEC I-10—Personnel Management 3
AGEC I-12—Agricultural Retailing 3
AGEC I-13—Agricultural Finance 3
AGEC I-14—Supervised Work Experience* 1

* Required for all management options

Courses for Farm Production and Agribusiness Management Majors

ANSC I-1—Introduction to Animal Science 3
ANSC I-2—Feeds and Feeding 3
ANSC I-3—Animal Health 3
ANSC I-4—Dairy Production 3
ANSC I-5—Genetic Improvement of Livestock 3
ANSC I-8—Livestock Management 1–3
ANSC I-10—Seminar 1
ENTM I-1—Insect Control 3
AGRO I-7—Grain and Forage Production I 3
AGRO I-10—Grain and Forage Production II 3
AGEC I-5—Financial Records and Analysis 3
AGEC I-7—Agricultural Marketing 3
AGEC I-11—Farm Management 3

Courses for Ornamental Horticulture and Turfgrass Majors

HORT I-2—Woody Ornamentals I 2
HORT I-3—Plant Propagation 3
HORT I-4—Landscape Design 3
HORT I-6—Nursery Management 3
HORT I-7—Greenhouse Management 2
HORT I-8—Arboriculture 3
HORT I-9—Landscape Contracting Management 3
HORT I-10—Floral Design I 2
HORT I-12—Floral Crop Production 2
HORT I-13—Floral Design II 2
HORT I-14—Landscape Maintenance 3
HORT I-15—Interior Plant Culture 2
HORT I-17—Floral Design III 2
HORT I-18—Woody Ornamentals II 2
HORT I-19—Interior Ornamentals 2
HORT I-20—Interior Plantscape Design 2
HORT I-21—Interior Plantscape Contracting 2
HORT I-22—Seminar 1
HORT I-23—Landscape Construction 3
ENTM I-2—Pests of Ornamental Plants 3
AGRO I-2—Turf Management I, II 2, 2
AGRO I-3—Lawn Care Management 3
AGRO I-4—Golf Course Management I 3
AGRO I-5—Golf Course Management II 3

For additional information, write Director, Institute of Applied Agriculture, The University of Maryland, College Park, MD 20742.

Virginia-Maryland Regional College of Veterinary Medicine—Maryland Campus

Professor and Acting Associate Dean: Mohanty
Professor: Marquardt
Associate Professors: Dutta, Mallinson, Manspeaker
Assistant Professors: Ingling, Penney, Robl, Snyder

The Virginia-Maryland Regional College of Veterinary Medicine is a College operated by Virginia Polytechnic Institute and State University and The University of Maryland. Each year 50 Virginia and 30 Maryland students comprise the entering class of a four-year program leading to a Doctor of Veterinary Medicine (DVM).

The first two and one-half years of instruction are given at Virginia Polytechnic Institute and State University in Blacksburg, Virginia. The final one and one-half years of instruction are given at several locations, including The University of Maryland College Park.

A student desiring admission to the College must complete the pre-veterinary requirements and apply for admission to the professional curriculum. Admission to this program is competitive and open to all Maryland residents.

Other Agricultural and Life Sciences Departments, Programs and Curricula

Biological Sciences Program

This program is designed for the student who is interested in a broader education in the biological sciences than is available in the programs for majors in the various departments of the Division of Agricultural and Life Sciences. It is appropriate for the entering student who wishes to explore the various areas of biology before specializing in the program offered by a single department, or for the student desiring to concentrate on a broad area of biology such as genetics or marine biology.

Advising of students in the General Biological Sciences Program is coordinated in a central advising office established by the Division of Agricultural and Life Sciences. There are three parts to this major: (1) basic introductory courses in biology, (2) supporting courses in math, chemistry, and physics, and (3) the advanced program. In the advanced program, students select one of several areas to emphasize, including marine biology, genetics, ecology, physiology, zoology, botany, microbiology, chemistry, animal sciences, and entomology. Alternatively, the student may elect to remain broad for the entire program, in which case the student is said to be a generalist. Individual programs to meet specific career goals may be developed between the student and the Coordinator Advisor. In each case, advising will be carried out in the department in which most of the work is to be taken. For careful planning and advising, students are urged to determine their emphasis early and no later than the beginning of the junior year. Changes in emphasis normally cannot be made during the senior year without delaying graduation.

The General Biological Sciences Honors Program is a special program for exceptionally talented and promising students. It emphasizes the scholarly approach to independent study. Information about this honors program may be obtained from the Coordinating Advisor.

Preparation for graduate study in a specialized area of biology is readily accomplished under this program by the judicious selection of junior-senior level courses in the proposed area of graduate concentration. Students in the program who are attempting to meet the requirements of a preprofessional program should also seek advice from advisors of those respective programs. Students in the program who wish to prepare for secondary school science teaching should contact the staff of the Science Teaching Center of the College of Education for information concerning requirements for certification.

Basic Introductory Courses in Biology. A grade of C or better is required in these courses:

1. One course in general biological principles, including laboratory, which may be satisfied by either of the following courses: BOTN 101, General Botany (4); or ZOOL 101, General Zoology (4).
2. Two courses in the diversity of living organisms: BOTN 202, the Plant Kingdom (4), and ZOOL 210, Animal Diversity (4).
3. One course on microorganisms: MICB 200, General Microbiology (4).
4. One course in basic genetics which may be satisfied by one of the following:
   a. ANSC 201, Basic Principles of Animal Genetics (3).
   b. BOTN 414, Plant Genetics (3).
   c. HORT 274, Genetics of Cultivated Plants (3).
   d. ZOOL 213, Genetics and Development (4).
   e. MICB 380, Bacterial Genetics (4).

Required Supporting Courses. An average of C or better is required in these courses.

1. Chemistry (16 credits). A minimum of four semesters of chemistry is required: CHEM 103, 113, 233, 243.
2. Mathematics (6–8 credits). Two semesters of calculus are required: MATH 220, 221, or MATH 140, 141.
3. Physics (8 credits). Two semesters of physics are required: PHYS 121, 122, or PHYS 141, 142.

It is not necessary that all of the basic and supporting courses listed above be completed before registering for advanced courses. However, the above courses are prerequisite to many of the advanced courses and should be completed early in the program.

Advanced Program. In addition to the required courses listed above, students must complete an approved curriculum that includes one course in statistics (BIOM 301, BIOM 401, STAT 250, STAT 400, STAT 464, or PSYC 200) and 19 credits of biological sciences selected from the courses listed below or courses which have been specifically approved by the General Biological Sciences Program Committee. A minimum of ten of these credits must be taken in the area of emphasis. At least two courses must involve laboratory or field work at the 300–400 level. At least 15 of the 19 credits of biological sciences must be completed in courses numbered 300 or above. Two participating departments must be represented by at least one course in the 15 credits of 300–400 level work. No 386/387 credits (experiential learning) will be accepted. Courses currently approved for the advanced program include:

AGRI 411.
AGRO 105, 403, 422, 423.
ANSC 211, 212, 252, 350, 401, 406, 411, 412, 413, 416, 425, 446, 452, 466.
BIOL 398, 399
All BOTN courses *except* BOTN 100, 101, 200, 202, 211, 414.
BCHM 261, 461, 462, 463, 464
All ENTM courses *except* ENTM 100, 111, 252.
GEOL 102, 331, 431, 432, 434, 452.
HORT 171 and 271.
All MICB courses *except* MICB 100, 200, 322.
NUSC 402, 403, 450.
NUTR 300, 430, 450.
PSYC 400, 402, 403, 410, 412, 479
All ZOOL courses *except* ZOOL 101, 146, 181, 207, 210, 213, 301, 346, 381.
ZOOL 328 requires prior approval of Coordinating Advisor.

Research experience in the various areas of biology, biochemistry, and psychology are possible under this plan by special arrangement with faculty research advisors and *prior* approval of Coordinating Advisor. Not more than three hours of special problems or research can be taken as part of the advanced program requirement. All advanced program curricula are subject to the approval of the General Biological Sciences Program Committee.

Botany *

Professor and Chairman: Patterson
Professors: Beam, Corbett, Kantzes, Krusberg, Lockard, Reveal, Sisler
Associate Professors: Barnett, Bottino, Cooke, Karlander, Motta, Racusen, Steiner, Sze, Teramura
Assistant Professors: Collmer, Forseth, Grybauskas, Hutcheson, Millay, Van Valkenburg, Wolniak
Lecturer: Berg
Instructors: Higgins, Koines

Because there is such a diverse range of career possibilities for students who major in botany, or plant biology, this major is designed to give students a broad background in supporting areas of biological sciences, chemistry, math and physics as well. In addition to the botany courses required of all majors (such as plant ecology, plant physiology, and plant genetics), this program allows students to take a number of botany or related electives to develop the student's area of interest within botany.

The Department offers instruction in the fields of physiology, pathology, ecology, taxonomy, anatomy-morphology, genetics, mycology, marine botany, nematology, virology, phycology and general botany.

All students, regardless of their areas of interest, must complete the Department of Botany requirements listed below. All required courses, including botany-related electives and supporting courses, must be passed with at least a grade of C. Botany-related electives may include no more than one lower-division course and must be approved by the advisor. In some areas of botany, an introductory course in geology or soils is highly recommended.

The Botany Department also offers a special program for exceptionally talented and promising students through the Honors Program which emphasizes the scholarly approach to independent study. Information concerning this program may be obtained from the Botany Honors Program Advisor.

Department of Botany Requirements

	Semester Credit Hours
BOTN 101—General Botany	4
BOTN 202—Plant Kingdom	4
BOTN 212—Plant Taxonomy	4
BOTN 221—Diseases of Plants	4
BOTN 398—Seminar	1
BOTN 414—Plant Genetics	3
BOTN 416—Principles of Plant Anatomy	4
BOTN 441—Plant Physiology	4
BOTN 462—Plant Ecology	2
BOTN 464—Plant Ecology Laboratory	2
Botany Electives or related electives	8–10
Total	40–42
Required Supportive Courses:	
CHEM 103, 113—General Chemistry I, II (4, 4)	8
CHEM 233, 243—Organic Chemistry I and II (4, 4)	8
MATH 140, 141—Calculus I, II (4, 4) or	
MATH 220, 221—Elementary Calculus (3, 3)	6–8
MICB 200—General Microbiology	4
PHYS 121, 122—Fundamentals of Physics I and II or	
PHYS 141, 142—Principles of Physics	8
A laboratory or field course in zoology or entomology	4
Total Supporting Course	38–40

* Requirements of this major are under review and may be changed prior to the 1986–87 academic year

Course Code Prefix—BOTN

Chemistry and Biochemistry

Professor and Chairman: Mazzocchi
Associate Chairman: Walters
Professors: Adler, Alexander, Ammon, Bailey, Bellama, Castellan, Freeman, Gerlt, Gordon, Greer, Grim, Hansen, Helz, Henery-Logan, Holmlund, Huheey, Jaquith, Jarvis, Keeney (Emeritus), Khanna, Kozarich, Mariano, Mazzocchi, McNesby (Emeritus), Miller, Moore, Munn, O'Haver, Ponnamperuma, Pratt (Emeritus), Rollinson (Emeritus), Stewart, C. Stuntz (Emeritus), Svirbely (Emeritus), Tossell, Vanderslice (Emeritus), Veitch (Emeritus), Walters, Weiner
Associate Professors: Armstrong, Boyd, DeShong, Devoe, Dunaway-Mariano, Heikkinen, Kasler, Mignerey, Murphy, Ondov, Sampugna
Assistant Professors: Brusilow, Herndon, Thirumalai
Research Professor: Bailey

The major in chemistry requires 39 credits in chemistry, of which 16 are lower-division and 23 are upper-division. Six credits of the 23 upper-division requirements must be selected from approved chemistry courses. The program is designed to provide the maximum amount of flexibility to students seeking preparation for either the traditional branches of chemistry or the interdisciplinary fields. In order to meet requirements for a degree to be certified by the American Chemical Society, students must complete two additional laboratory courses selected from CHEM 433, 443, 425, and BCHM 463.

A sample program, listing only the required or recommended courses, is given below. It is expected that each semester's electives will include courses intended to satisfy the general requirements of the University or of the Division of Agricultural and Life Sciences, plus others of the student's choice.

Each required chemistry course must be passed with a minimum grade of C. Required supporting courses must be passed with a C average.

	Semester Credit Hours I	II
First Year		
**CHEM 103	4	
**MATH 140*	4	
Electives	7	
**CHEM 113		4
MATH 141*		4
Approved Biological Science Elective		4
Electives		3
Total	15	15
Second Year		
CHEM 233	4	
PHYS 141	4	
Electives	7	7
CHEM 243		4
PHYS 142		4
Total	15	15
Third Year		
CHEM 321	4	
CHEM 481	3	
CHEM 483	2	
Electives	6	
CHEM 482		3
CHEM 484		2
Electives		10
Total	15	15
Fourth Year		
CHEM 401	3	
Other 400-level CHEM	3	3
Electives	9	
Electives		12
Total	15	15

* Students initially placed in MATH 115 will delay MATH 140 and 141 one semester.

** May satisfy a Divisional and/or a University Studies Program Requirement. All other Divisional and University Studies Program Requirements will replace electives.

The Department's Honors Program begins in the junior year. Interested students should contact the Director of Undergraduate Studies for further information.

The Department also offers a major in biochemistry. In addition to the 16 credits of lower-division chemistry, the program requires CHEM 321 and BCHM 461, 462, and 464, CHEM 481, 482 and 483, MATH 140 and 141, PHYS 141 and 142, and nine credits of approved biological science that must include at least one upper-division course. A sample program, listing only the required courses, is given below. It is expected that each semester's electives will include courses intended to satisfy the general requirements of the University or of the Division of Agricultural and Life Sciences, plus others of the student's choice.

Each required chemistry and biochemistry course must be passed with a minimum grade of C. Required supporting courses must be passed with a C average.

	Semester Credit Hours I	II
First Year		
**CHEM 103 or 105	4	
**MATH 140*	4	
Electives	7	
**CHEM 113		4
MATH 141		4
Approved Biological Science Elective		4
Electives		3
Total	15	15

* Students initially placed in MATH 115 will delay MATH 140 and 141 one semester.

** May satisfy a Divisional and/or a University Studies Program Requirement. All other Divisional and University Studies Program Requirements will replace electives.

Second Year		
CHEM 233 or 235	4	
PHYS 141	4	
Electives	7	
CHEM 243 or 245		4
PHYS 142		4
Approved Biological Science Elective		1–4
Electives		6
Total	15	15–18
Third Year		
CHEM 321	4	
CHEM 481	3	
CHEM 483	2	
Electives	6	
CHEM 482		3
BCHM 461		3
Electives		9
Total	15	15
Fourth Year		
BCHM 462	3	
Approved Upper Level Biological Science	4	
Electives	8	
BCHM 464		2
Electives		13
Total	15	15

Course Code Prefix—BCHM, CHEM

Agricultural Chemistry

A program in Agricultural Chemistry is offered within the College of Agriculture. See page 58 for details.

Entomology

Professor and Chairman: Steinhauer
Professors: Barbosa, Bickley (Emeritus), Bottrell, Davidson, Denno, Harrison, Jones (Emeritus), Menzer, Messersmith, Wood
Associate Professors: Armstrong, Bissell (Emeritus), Dively, Hellman, Linduska, Ma, Nelson, Reichelderfer
Assistant Professors: Lamp, Mitter, Raupp, Scott

This curriculum prepares students for various types of entomological positions or for graduate work in any of the specialized areas of entomology. Professional entomologists are engaged in fundamental and applied research in university, government, and private laboratories; regulatory and control activities with federal and state agencies; commercial pest control and pest management services, sales and development programs with chemical companies and other commercial organizations, consulting, extension work; and teaching.

Students should work closely with their advisors in choosing electives. The curriculum is designed to allow majors intending to go to graduate school to broaden their preparation. Those intending to begin a career after the baccalaureate would be advised to concentrate on a more defined curriculum.

Department of Entomology Requirements

	Semester Credit Hours
University Studies Program Requirements	40
ZOOL 101—General Zoology or*	4
ZOOL 210—Animal Diversity	4
BOTN 101—General Botany *	4
CHEM 103, 113—General Chemistry I, II	8
CHEM 233, 243—Organic Chemistry I, II	8
2 of the following 4 courses:	
MATH 220—Elementary Calculus I*	3
MATH 221—Elementary Calculus II	3
BIOM 401—Agricultural Biometrics	3
STAT 464—Introduction to Biostatistics	3
ZOOL 213—Genetics and Development or BOTN 414—Plant Genetics	4 (3)
ZOOL 212—Ecology, Evolution and Behavior	4
MICB 200—General Microbiology*	4
2 of the following 6 courses:	
BCHM 461—Biochemistry I	3
BOTN 212—Plant Taxonomy	3
BOTN 221—Diseases of Plants	4
BOTN 441—Plant Physiology	4
ZOOL 411—Cell Biology	4
ZOOL 422—Vertebrate Physiology	4
ENTM 205—An Introduction to Entomology	4
ENTM 432—Insect Physiology	4
ENTM 398—General Colloquium in Entomology	1
ENTM 399—Special Problems	2
ENTM 423—Insect Morphology and Classification	4
ENTM 451—Insect Pests of Agricultural Crops **	4
Electives ***	22–27
	120

* May satisfy Divisional Requirements and/or a University Studies Requirement.

** In addition to ENTM 451, students pursuing an applied program are encouraged to take ENTM 351 as an elective.

*** Students who intend to pursue a career in applied entomology should elect the following courses: BOTN 212, BOTN 221, AGRI 401, ZOOL 422, BOTN 441, AGRO 453 (Weed Control), AGRO 423 (Soil and Water Pollution). These 7 courses are prerequisite to the M.S. program in pest management.

Course Code Prefix—ENTM

Geology

Professor and Chairman: Chang
Professor: Adler
Associate Professors: Ridky, Segovia, Siegrist, Stifel, Weidner, Wylie
Assistant Professors: Candela, McLellan, Nielsen

Geology is the basic science of the earth. In its broadest sense, geology concerns itself with planetary formation and modification with emphasis on the study of the planet Earth. This study directs its attention to the earth's internal and external structure, materials, chemical and physical processes and its physical and biological history. Geology concerns itself with the application of geological principles and with application of physics, chemistry, biology and mathematics to the understanding of our planet.

Geological studies thus encompass understanding the development of life from the fossil record, the mechanics of crustal movement and earthquake production, the evolution of the oceans and their interaction with land, the origin and emplacement of mineral and fuel resources and the determination of man's impact on the geological environment.

Geological scientists find employment in government, industrial and academic establishments. In general, graduate training is expected for advancement to the most rewarding positions. Most industrial positions require an M.S. degree. Geology is enjoying a strong employment outlook at the present because of our mineral, fuel and environmental concerns. At this time, students with the B.S., particularly those with training in geophysics, can find satisfactory employment. However, graduate school is strongly recommended for those students desiring a professional career in the geosciences.

The Geology Program includes a broad range of undergraduate courses to accommodate both geology majors and students interested in selected aspects of the science of the Earth. Opportunities exist for undergraduate research projects, on a personal level, between students and faculty members.

The geology curriculum is designed to meet the requirements of industry, graduate school and government. However, students may select, at their option, geology electives that are designed for a particular interest, rather than for the broad needs of a professional career. All required geology courses must be completed with a grade of C or better. An average of C is required in the supporting courses. Courses required for the B.S. in geology are listed below.

	Semester Credit Hours
University Studies Program Requirements*	30
Departmental Requirements	44–46
GEOL 100 (3)	
GEOL 102 (3)	
GEOL 110 (1)	
GEOL 112 (1)	
GEOL 321 (3)	
GEOL 322 (4)	
GEOL 331 (4)	
GEOL 341 (4)	
GEOL 393 (3)	
GEOL 394 (3)	
GEOL 490 (6)	
Three of the following six courses:	
GEOL 340 (4)	

GEOL 342 (4)
GEOL 423 (3)
GEOL 443 (3)
GEOL 445 (3)
GEOL 446 (3)

Supporting Requirements 27–28
CHEM 103, 113 (4, 4)
MATH 140, 141 (4, 4)
PHYS 141, 142 (4, 4)
Biological Science (3 or 4)**

Electives 16–19

* Of the normal USP requirements (40 credit hours), at least ten credits are met by the major requirements in mathematics, chemistry or geology (basic mathematical skill and Distributive Studies Area B).

** BIOL 101, 124, BOTN 100 or MICB 100 may not be used to meet this requirement. Students should consult with their advisor for approved biological science courses.

Course Code Prefix—GEOL

Microbiology

Professor and Chairman: Joseph
Professors: Colwell, Cook, Doetsch (Emeritus), Faber (Emeritus), Hetrick, Pelczar (Emeritus)
Associate Professors: MacQuillan, Voll, Weiner
Assistant Professor: Stein
Adjunct Assistant Professor: Stern
Associate Research Scientists: Grimes, Hamilton
Instructor: Powell

The Department of Microbiology has as its primary aim providing the student with thorough and rigorous training in microbiology. This entails knowledge of the basic concepts of bacterial cytology, physiology, taxonomy, metabolism, ecology, and genetics, as well as an understanding of the biology of infectious disease, immunology, general virology, and various applications of microbiological principles to public health and industrial processes. In addition, the department pursues a broad and vigorous program of basic research, and encourages original thought and investigation in the above-mentioned areas.

The department also provides desirable courses for students majoring in allied departments who wish to obtain vital, supplementary information. Every effort has been made to present the subject matter of microbiology as a basic core of material that is pertinent to all biological sciences.

The curriculum outlined below, which leads to a bachelor's degree, includes the basic courses in microbiology and allied fields.

A student planning a major in microbiology should consult a departmental advisor as soon as possible after deciding upon this action. The supporting courses should be chosen only from the biological and physical sciences.

No microbiology course with a grade less than C may be used to satisfy major requirements. In addition, for graduation, students must achieve an overall C average in the major courses plus required supporting courses.

Information concerning the Honors Program may be obtained in the departmental office.

The major in the department consists of a minimum of twenty-four semester hours. These must include MICB 200—General Microbiology (4), and MICB 440—Pathogenic Microbiology (4). In addition, at least sixteen additional hours must be selected from the following: MICB 310—Applied Microbiology (4), MICB 300—Microbiological Literature (1), MICB 330—Microbial Ecology (2), MICB 360—Medical Virology (3), MICB 379—Honors Research (3), MICB 380—Microbial Genetics (4), MICB 388—Special Topics* (1–4), MICB 399—Microbiological Problems** (3), MICB 400—Systematic Microbiology (2), MICB 410—History of Microbiology (1), MICB 420—Epidemiology and Public Health (2), MICB 430—Marine Microbiology (2), MICB 431—Marine Microbiology Laboratory (2), MICB 450—Immunology (4), MICB 460—General Virology (3), MICB 470—Microbial Physiology (3), MICB 490—Microbial Fermentations (2), MICB 491—Microbial Fermentations Laboratory (2).

MICB 100, Basic Microbiology (3) is a University Studies course and may not be used to fulfill the twenty-four semester credits required for a major in microbiology.

* MICB 388—A maximum of 4 semester hours may be applied toward the major requirements.

** Either MICB 399 or MICB 388, but not both, to meet the major requirements.

Required as courses supporting the major are CHEM 103 (4), 113 (4), 233 (4), 243 (4)—General Chemistry I and II, Organic Chemistry I and II (with laboratories); BCHM 461, 462, (3, 3)—Biochemistry; MATH 110, 111 (3, 3)—Introduction to Mathematics I, II, or MATH 115 (3) and one course in statistics (3–4), of Physics (4, 4), ZOOL 101—General Zoology (4) or BOTN 101—General Botany (4), and four additional semester hours in a biological science (with laboratory) (MATH 220, 221—Introductory Calculus (3, 3) or equivalent is strongly recommended but not required.)

Course Code Prefix—MICB

Zoology

Professor and Chairman: Cortiss
Professors: Allan, Brinkley, Carter-Porges, Clark, Gill, Highton, Levitan, Pierce, Vermeij
Associate Professors: Barnett, Bonar, Colombini, Goode, Higgins, Imberski, Inouye, Linder, Reaka, Small, Smith-Gill
Assistant Professors: Ades, Borgia, Coyne, Olek, Shapiro
Instructors: Edds, Piper, Spalding
Adjunct Professors: Kleiman, Manning, Morton, O'Brien, Potter
Adjunct Associate Professors: Kelly, Wemmer
Visiting Lecturer: Kapp
Associate Research Scientist: Zipser

Description of Program. The Department of Zoology offers a program leading to a B.S. with a major in zoology. This program is designed to give each student an appreciation of the diversity of problems studied by zoologists, an opportunity to explore in depth more restricted areas of zoology, and an appreciation of the nature of observation or experimentation appropriate to investigations within these fields. The requirements of 30 hours in zoology (including one core course in each of four broad areas) and the required supporting courses in chemistry, mathematics and physics permit students to develop their interest in the general field of zoology or to concentrate in an area of specialization.

Curriculum for Zoology Majors. All majors are required to complete a minimum of 30 credit hours in zoology with a grade of C in their major and an average grade of C in the supporting courses. Four required core courses provide the prerequisite background information for junior-senior level courses in the major. It is not necessary to complete all four core courses before registering for junior-senior level courses, but it is strongly recommended that all four be completed by the end of the junior year. These required core courses are:

ZOOL 210—Animal Diversity (4)
ZOOL 211—Cell Biology & Physiology (4), prerequisite one semester of general chemistry (CHEM 103)
ZOOL 212—Ecology, Evolution and Behavior (4)
ZOOL 313—Genetics (4), prerequisite one semester of organic chemistry

Fourteen hours of junior-senior level courses, including two courses with laboratory, must be taken to complete the major. Students may specialize at this level by registering for those courses particularly appropriate to their academic objectives. ZOOL 101, 181, 201, 202, 301, 328Z, 330, 346, 361, and 381 do not satisfy major requirements. ZOOL 308H, 309H, 318H and up to 3 credits of ZOOL 319, Special Problems in Zoology, may be used to fulfill the required 14 hours at the junior-senior level but not the laboratory requirements.

Required Supporting Courses

1. CHEM 103, 113—General Chemistry I, II (4, 4)
   OR CHEM 105, 115—Principles of General Chemistry I, II (4, 4)
2. CHEM 233, 243—Organic Chemistry I, II (4, 4)
   OR CHEM 235, 245—Principles of Organic Chemistry I, II (4, 4)
3. Mathematics through one year of calculus, i.e., completion of MATH 220, 221 Elementary Calculus (3,3) or MATH 140, 141, Analysis I, II (4,4)
4. Physics 121, 122, Fundamentals of Physics (4, 4) or Physics 141, 142, Principles of Physics (4,4)
5. One of the following courses:
   BCHM 461—Biochemistry I (3)
   BIOM 301—Introduction to Biometrics (3)
   BIOM 401—Biostatistics (4)
   MATH 240—Linear Algebra (4)
   MATH 400—Vectors and Matrices (3)
   PSYC 200—Statistical Methods in Psychology (3)
   STAT 250—Introduction to Statistical Models (3)
   STAT 400—Applied Probability and Statistics I (3)
   STAT 464—Introduction to Biostatistics (3)

Note: Requirements for the zoology major may change prior to the 1986–87 academic year.

Advisement. Sample programs for zoology majors interested in different fields may be obtained from the zoology office, 2227 Zoology-Psychology Building. All majors are required to consult with their assigned Zoology Department Advisor at least once every semester. Students desiring to enter graduate study in certain areas of zoology should take biochemistry, physical chemistry, advanced statistics, advanced mathematics, and/or philosophy of science as a part of their undergraduate electives. Courses of interest to zoology majors are also offered in the Departments of Animal Sciences, Anthropology, Botany, Electrical Engineering, Entomology, Geography, Geology, Microbiology, and Psychology.

Honors. The Department of Zoology also offers a special program for the exceptionally talented and promising student. The Honors Program emphasizes the scholarly approach to independent study. Information regarding this program may be obtained from the departmental office or from the chairman of the Zoology Honors Program.

Course Code Prefix—ZOOL

The Agricultural Experiment Station

The Maryland Agricultural Experiment Station is currently conducting more than 200 research projects. These are conducted by faculty who supervise and direct research assistants, graduate and undergraduate students and technicians. The research may be conducted in laboratories at UMCP or UMES or at one of the nine field locations throughout Maryland operated by the Experiment Station or even in fields, herds or flocks of cooperating farmers.

The overall objective of the Experiment Station is to enhance all aspects of Maryland agriculture for the benefit of farmers, farm-related business and consumers through optimal utilization, conservation and protection of soil and water resources. Genetic principles are studied and applied in the improvement of turf and ornamentals, vegetable crops, field crops, poultry, dairy and other animals. Similarly, pathological principles are of concern in improvement of methods of identification, prevention and/or control of plant and animal diseases. Biochemistry plays an important role in evaluating the nutritional quality of crops produced, the efficiency of feed conversion by poultry and animals or the quality of plant and animal products for human consumption. Research in progress is concerned with improvement of processing systems to enhance food quality on one hand and the impact of nutritional deficiencies and means of remedying these on the other. Also directly in the consumer area is the study of clothing quality.

Improved production techniques including waste utilization or disposal require studies involving soil-moisture-plant relationships and plant, bird, or animal-environment relationships and also studies of the applications of engineering for producing or maintaining the optimal environment for biological systems.

Studies of biological and mechanical methods and improved chemical control of insects in the field, forests, food processing chain and the home are continuous.

The socio-economics of changing agricultural systems are a major research area and increasing attention is being oriented towards rural development, including resource utilization for non-farm residents and recreation.

The Maryland Agricultural Experiment Station was established in 1888 to comply with the Hatch Act of 1887 authorizing the establishment of an agricultural experiment station at the Land Grant Colleges. Actually, the charter of the Maryland Agricultural College in 1856 specifically authorized establishment of a demonstration farm. The Station is supported by federal funds under the Hatch Act as amended, State appropriations, grants and contracts with State and federal agencies and by gifts or other support from individual and farm-related businesses and industry.

Cooperative Extension Service

As part of the total university, the Cooperative Extension Service takes The University of Maryland to the people of Maryland, wherever they are. In its role as the "off-campus, non-credit, out-of-classroom" arm of the University, it extends the classroom to all parts of the State. With its uniquely effective educational delivery system, the Cooperative Extension Service helps people to help themselves, to define their problems, to evaluate reasonable alternatives, and to generate action to solve their problems.

The Cooperative Extension Service was authorized by Congress in 1914 under the Smith-Lever Act and is funded by a three-way partnership. Support comes from the federal government for both 1862 and 1890 Land Grant institutions, and from the State and all 23 counties and Baltimore City in Maryland.

General administrative offices of the Maryland Cooperative Extension Service are located at The University of Maryland College Park (UMCP) and the administration of the 1890 Program (an integral part of the total MCES effort) is from offices at The University of Maryland Eastern Shore (UMES).

Off-campus faculty, located in each county and in Baltimore City, are the "front lines" that deliver University resources in ways people can use them effectively. These field faculty rely on campus based Cooperative Extension specialists at both UMCP and UMES to provide up-to-date, meaningful information and for aid in planning and conducting relevant educational programs. Many of the Cooperative Extension Service faculty at the State level carry joint appointments with teaching and research, especially in the UMCP Division of Agricultural and Life Sciences.

The Maryland Cooperative Extension Service is known for its programs in agriculture and natural resources (including care of urban home grounds and gardens), home economics, 4–H and youth, community and resource development and energy, and marine science. Working through organized groups such as homemakers' clubs, farmers' groups and cooperatives, agribusiness firms, watermen's organizations, civic and social organizations, governmental agency personnel and elected officials, the Cooperative Extension Service multiplies its effects. It maintains a close working relationship with the Maryland Department of Agriculture and other State agencies and organizations. More than 22,000 volunteers in Maryland give generously of their time and energy.

Time-tested, informal educational methods used are farm and home visits, phone and office conferences, and structured events such as meetings, institutes, workshops and training conferences. Carefully planned teaching events include tours, field days, and demonstrations. Indirect communications utilize circular letters, radio and television programs, newspaper articles and columns, articles in specialized publications, and exhibits to reach a statewide audience.

The Cooperative Extension Service is committed to making its programs available to all people without regard to race, color, creed, sex, marital status, personal appearance, age, national origin, political affiliation, or handicap.

In each county and in Baltimore City competent extension agents conduct educational work in program areas consistent with the needs of the citizenry and as funds permit. The county staff is supported by a faculty of specialists in the Division of Agricultural and Life Sciences at UMCP and the agricultural programs at UMES. Through these efforts, local people are assisted in finding solutions to their problems.

The Cooperative Extension Service works in close harmony and association with many groups and organizations. In addition to work on farms and with agri-businesses, extension programs are aimed at many small and part-time farmers, rural non-farm and urban family consumers as well as watermen and marine-related businessmen. Both rural and urban families learn good food habits through the Expanded Food and Nutrition Education Program. Thousands of boys and girls gain leadership knowledge and experience and are provided practical educational instruction in 4–H clubs and other youth groups.

To accomplish its mission, the Cooperative Extension Service works closely with teaching and research faculty of the University and with units of the University outside of agriculture, as well as state and federal agencies and private groups. Short courses, workshops and conferences in various fields of interest are conducted at UMCP and other locations throughout the state. A wide variety of publications and radio and television programs also are used to reach the people of Maryland.

Division of Arts and Humanities

Provost: Brecht (acting)

The Division of Arts and Humanities offers courses and programs for both majors and non-majors. Students interested in the traditional fields of the liberal arts will find many offerings in the Departments of Art, Music, Communication Arts and Theatre, English and the foreign languages, History, and Philosophy. Here they will study the artifacts and documents of the past and the present, reflecting both western and non-western civilizations.

The Division also offers instruction in the creative and performing areas—studio art, music, dance, theatre, creative writing, and film—as well as professional training in architecture and modern communications (journalism, radio-television-film).

Arts and Humanities encourages its students to take several approaches to the study of human cultural behavior. Majors are available in American, East Asian, Jewish, linguistics, and Russian studies. Faculty representing various disciplines will advise students on such area studies as Latin America. Or a student, with faculty help, may devise coherent programs in, for example, women's studies, popular culture, the history and philosophy of science, and the classical, medieval, or renaissance world. All of these programs, and many others that a student's imagination and interest may suggest, are strengthened by courses from other divisions.

Many of the major programs in Arts and Humanities make excellent pre-law preparation. In fact, with a judicious choice of electives in this and other divisions, students with any major in Arts and Humanities may prepare themselves for careers or advanced training in business, government, law, teaching, publishing, library work, and museum work, among others. Internship opportunities throughout the Division should enhance this process.

Most careers in which the graduates of Arts and Humanities will eventually find themselves require and reward the abilities fostered by a liberal education: the ability to write clear, carefully organized, readable English, to speak forcefully and persuasively, and to think logically and critically. The programs in the Division of Arts and Humanities, therefore, are concerned with developing the qualities of verbal facility and adaptability needed for career success.

The chief administrative officer of the Division of Arts and Humanities is the Provost. Staff in the Provost's office serve as ombudsmen for students. The Provost's office is responsible for certifying that students have met all degree requirements. The staff evaluates transfer credits and coordinates the advising of newly admitted students. It maintains a liaison with the various faculty advisors and academic programs within the Division. The office of the Provost is the place where students can go when they are lost or have any question about academic policies or procedures. The staff can adjust courses or schedules, providing it is ethically justifiable. The Provost's office can interpret existing regulations and, where it again feels ethically justified, can make certain exceptions. Students majoring in architecture and journalism will work directly with the staffs of the School of Architecture and the College of Journalism. During registration, students are usually seen on a first-come, first-served basis. On other occasions, if the problem is an emergency or is truly important, the Provost, deans, and advisors will stay as long as necessary.

Each entering student in this Division will be assigned a faculty advisor who will help select courses and programs relevant to the student's academic objectives. As soon as a student selects a major field of study, a faculty advisor representing that area will be assigned.

The Division is comprised of the following academic units.

School of Architecture
College of Journalism
American Studies Department
Art Department
Center for Mediterranean Archeology
Center for Philosophy and Public Policy
Center for Renaissance and Baroque Studies
Classics Department
Communication Arts and Theatre Department
Comparative Literature Program
Dance Department
English Language and Literature Department
French and Italian Languages and Literatures Department
Germanic and Slavic Languages and Literatures Department
Hebrew and East Asian Languages and Literatures Department
History Department
Jewish Studies Program
Linguistics Program
Maryland English Institute
Music Department
Philosophy Department
Spanish and Portuguese Languages and Literatures Department
Women's Studies Program

All of these units, with the exception of the Women's Studies Program and the various centers, offer major programs which lead to a degree. Each has assigned faculty to serve as academic advisors.

Entrance Requirements. The student who intends to pursue a program of study in the Division of Arts and Humanities includes the following subjects in high school: English, four units; college preparatory mathematics (algebra, plane geometry), three or four units; biological and physical sciences, two or three units; foreign language, four units; history and social sciences, two or more units. Students wishing to major in one of the creative or performing arts are encouraged to seek training in the skills associated with such an area prior to matriculation. Students applying for entrance to these programs may be required to audition, present slides or submit a portfolio as a part of the admission requirements. Entrance requirements for the School of Architecture and the College of Journalism are given below.

Degrees. Students who satisfactorily complete division requirements are awarded the degree of Bachelor of Arts. Those who complete satisfactorily a special preprofessional program in the Department of Music are awarded the degree of Bachelor of Music. The School of Architecture and the College of Journalism award the Bachelor of Science degree.

General Requirements for All Degrees

A. A minimum of 120 semester hours with at least a C average
B. General University Requirements or University Studies Program Requirements
C. Division, College, or School degree requirements
D. Major requirements

The following divisional requirements apply only to students earning Bachelor of Arts degrees from the Division of Arts and Humanities. For information concerning other degree programs within the Division (B.S. in the School of Architecture, B.S. in the College of Journalism, and B.Mus. in the Department of Music), the student should consult advisors in those units.

Division Requirements

Note

Should there be any question as to whether a course meets a specified divisional requirement, it shall be resolved by the divisional office in consultation with the department offering the course.

Distribution

A minimum of 45 semester hours of the total of 120 must be upper-level (i.e., courses numbered 300–499) work.

Foreign Language

Demonstration of proficiency equivalent to the level achieved by completion of the first 12 semester hours study of a foreign language.

(a) This requirement may be met by students who have successfully completed level four in high school in one foreign language or level two in each of two foreign languages.
(b) Students who, by virtue of residence abroad or independent study or any other means, have attained the standard ordinarily reached on completion of the first 12 semester hours of foreign language study at The University of Maryland, shall be deemed to have satisfied this requirement on achievement of a sufficiently high score in an examination acceptable to the foreign language department or program concerned.

Speech

Successful completion of one of the following courses in speech communication: SPCH 100, 107, 125, 220, or 230.

Students who have successfully completed a full unit of speech in high school shall be deemed to have satisfied the speech requirement.

Major Requirements

Completion of a program of study consisting of a major and supporting courses as specified by one of the academic units of the division. No program of study shall require in excess of 60 semester hours.

Students should consult the unit in which they will major for specific details.

Each student chooses a field of concentration (major). He may make this choice as early as he wishes; however, once he has earned 56 hours of acceptable credit, he *must* choose a major before his next registration.

In programs leading to the baccalaureate degree, the student must also have a secondary field of concentration (supporting courses). The courses constituting the major and the supporting courses must conform to the requirements of the department in which the student majors.

The student must have an average of not less than C in the introductory courses in the field in which he intends to major.

A major shall consist, in addition to the lower division departmental prerequisites, of 24–40 hours, at least twelve of which must be in courses numbered 300 or 400 and at least twelve of which must be taken at The University of Maryland.

Each major program includes a group of "supporting courses," formerly called minors, that are designed to contribute a better understanding of the major. The nature and number of these courses are under the control of the major department.

The average grade of the work taken for the major must be at least C; some departments will count toward satisfaction of the major requirement no course completed with a grade of less than C. The average grade of the work taken in the major and supporting courses combined must be at least C. A general average of C in courses taken at The University of Maryland is required for graduation.

Courses taken to fulfill General University Requirements may not be used toward divisional, major, or supporting course requirements. However, courses taken to fulfill University Studies Program Requirements may be used toward the divisional, major, and supporting course requirement.

Advisors. Freshmen students will be assigned advisors to assist them in the selection of courses and the choice of a major. After selecting a major, sophomore students and above will be advised by faculty members in the major department.

Students in the School of Architecture and College of Journalism should consult their deans.

Certification of High School Teachers. If courses are properly chosen in the field of education, a prospective high school teacher can prepare for high school positions, with a major and supporting courses in certain of the departments of this division. A student who wishes to work for a teacher's certificate must consult the College of Education in the second semester of the sophomore year and apply for admission to the "Teacher Education" program.

Honors. Departmental Honors Programs are offered in the Departments of English, French, German, History, Music, Philosophy, Spanish, and Communication Arts and Theatre. Departmental Honors Programs are administered by an Honors Committee within each department. Admission to a Departmental Honors Program ordinarily occurs at the beginning of the first or second semester of the student's junior year. As a rule, only students with a cumulative grade point average of at least 3.0 are admitted. A comprehensive examination over the field of the major program is given to a candidate near the end of the senior year. On the basis of the student's performance on the Honors Comprehensive Examination and in meeting such other requirements as may be set by the Departmental Honors Committee, the faculty may vote to recommend the candidate for the appropriate degree with (departmental) honors or for the appropriate announcement in the commencement program and by citation on the student's academic record and diploma.

Students in the Departmental Honors Programs enjoy some academic privileges similar to those of graduate students.

Kappa Tau Alpha. The Maryland chapter of Kappa Tau Alpha was chartered in 1961. Founded in 1910, this national honor society has 39 chapters at universities offering graduate or undergraduate preparation for careers in professional journalism. It is dedicated to recognition and promotion of scholarship in journalism. Among its activities is an annual award for an outstanding piece of published research in journalism and mass communications. (Also see College of Journalism.)

Phi Beta Kappa. Consult the description of Phi Beta Kappa in Part 1 of this catalog, under Office of Academic Affairs, Special Opportunities.

School of Architecture

Professor and Dean: Steffian
Lecturer and Associate Dean: Sachs
Assistant to the Dean: Lapanne
Professors: Hill, Loss, Lu, Schlesinger
Associate Professors: Bechhoefer, Bennett, DuPuy, Etlin, Fogle, Johns, Lewis, Schumacher, Vann
Assistant Professors: Berke, McInturff, Wiedemann
Lecturers: Dynerman, Kennett, McMichael, McWhorter

Location. The School of Architecture of The University of Maryland is located between Washington, D.C., and the city of Baltimore, in the midst of a large number of historic communities and a varied physical environment. The resulting opportunity for environmental design study is unique.

Degree Programs. The School offers a graduate program leading to the degree, Master of Architecture, and four-year undergraduate programs leading to Bachelor of Science degrees in two major fields of study: architecture and urban studies. The undergraduate major in architecture is designed to minimize the time required to complete the curriculum leading to the professional degree, Master of Architecture. The urban studies program is designed for students admitted to the School who desire strong academic preparation in architecture and urban studies subjects at the undergraduate level, but who do not plan to pursue a career in architecture.

Pre-Architecture. Through a selective admissions process, students are generally admitted to the baccalaureate programs in architecture in the junior year, or after completing 56 college credits. Occasionally, outstanding students may be admitted directly from high school.

Prior to admission to the baccalaureate programs as juniors, students at The University of Maryland College Park (UMCP) may enroll in a two-year pre-architecture program coordinated in the Office of the Provost of the Division of Arts and Humanities. Pre-architecture is open to any UMCP student and provides a program of study for the first two years which includes the basic requirements of the University Studies Program plus other pre-architecture requirements (ENGL 101, MATH 220, PHYS 121, PHYS 122, ARCH 170, ARCH 222, ARCH 242). Students completing the pre-architecture program may apply to the School by following the admissions procedures described below.

Objectives of the Curriculum. The School's basic mission is to provide general education and professional training and to develop the skills required by the graduate architect. Its curriculum in architecture is organized around courses in architectural and urban design, architectural history and theory, and architectural science and technology. Although its program is demanding, many electives—both in architecture and related fields and in the sciences and humanities—are also available. Courses in design studio involve the student in a series of design case studies, often drawn from actual situations in the surrounding environment. Both science/technology and design courses utilize field trips, "hands-on" experience, and the expertise of visiting critics and lecturers as well as regular faculty.

Career Opportunities. The B.S. degrees in architecture and urban studies will qualify the graduate to pursue a career in any of a number of fields, such as construction, real estate development, public administration or historic preservation, or to continue in graduate work in professional fields such as architecture, urban planning or law.

The graduate of the Master's degree program in architecture will be qualified to enter the profession of architecture in private practice, as an employee of a public agency at the local, state or federal level, or to enter any one of a number of other career paths.

Although the changing patterns of world and national problems can be expected to have major impacts on the practice of architecture and urban planning in the coming decades, it is clear that well-prepared environmental designers and architects will continue to be in demand as the physical environment in which we live and work is adapted to suit new circumstances. Architecture as a field of activity will continue to provide personal challenges of the highest order, the opportunity for varied work and for public service, and the chance to see others benefiting from and enjoying the products of one's efforts.

The School's professional program is accredited by the National Architectural Accreditation Board, Inc., enabling graduates to qualify for licensure in all fifty states, and by reciprocal agreement, in several foreign countries.

Faculty. The faculty of the School staff the four main curriculum areas: design; science-technology; history-theory and urban planning-urban design. All faculty members are active in professional practice and/or research in their respective areas of interest. For example, all design faculty members maintain active interests in professional practice, ranging from small residential work to large scale urban projects. Several members of the faculty have been retained as design consultants to local communities. Many faculty design projects have been recognized through local, national and international awards programs and publications. History faculty are active in classical field archeology in the Middle East and North Africa, in research in American and modern architecture and in medieval architectural scholarship. Science-technology faculty are active in research in solar energy and hazard mitigation, research grants have been awarded by national agencies.

Facilities. The School is housed in a modern, air-conditioned building providing work stations for each student, a large auditorium, and seminar and classroom facilities. A well-equipped woodworking and model shop, darkroom facilities, a lab equipped with testing machines and various instruments used in studying the ambient environment, and computer terminal facilities are also provided. The Architecture Library, one of the finest in the nation, contains some 24,000 volumes and 150 current periodicals. A special collection room of 12,000 books includes 5,000 volumes on world expositions. A visual resources facility includes a reserve slide collection of 180,000 slides on architecture, landscape architecture, urban planning, architectural science and technology as well as audio-visual equipment for classroom and studio use.

Special Resources and Opportunities. The School is a member of The Architectural Research Centers Consortium, Inc, a group of over twenty five schools and centers whose objective is to increase the quality and quantity of architectural research. Current research is in process through funding by agencies such as the National Science Foundation, providing research opportunities for faculty and students.

The School provides learning experiences through CADRE Corporation, a non-profit Center for Architectural Design and Research housed in the School, which provides an organizational framework for faculty and students to undertake contract research and design projects appropriate to the School's fundamental education mission. CADRE Corporation projects include building and urban design, urban studies, building technology, historic preservation, architectural archaeology, studies in energy conservation, or other work for which the School's resources and interests are uniquely suited.

The School supports The University of Maryland Caesarea Project, an on-going archaeological excavation at Caesarea Maritima in Israel. Qualified students may participate here as they have in the past at Carthage (Tunisia) and Humayma (Jordan) as well as on the underwater excavations at Herod's Harbor in Caesarea.

A summer workshop for historic preservation is sponsored by the School each year in Cape May, N.J., a designated national historic landmark district. Students may earn credit doing hands-on restoration work with the city's unique collection of Victorian structures and by attending lectures presented by visiting architects, preservationists and scholars.

Financial Assistance. For promising prospective applicants who might not otherwise be able to attend the University's School of Architecture, a number of grants and scholarships are available, some earmarked specifically for architecture students. New students and those already enrolled must apply before February 15. All requests for information concerning these awards should be made to: Director, Student Financial Aid, The University of Maryland, College Park, MD 20742.

Admissions. Admission to the School of Architecture is selective. Students are normally admitted to the undergraduate majors in architecture and in urban studies after completing 56 credits of general and prerequisite work. Early admission is possible directly from high school for outstanding students who meet one of the following standards: (1) 3.5 GPA in high school and combined SAT score of 1200; (2) National Merit Scholarship finalist or (3) recipient of Maryland Distinguished, Banneker, Chancellor's Scholarship or equivalent award. Such students need not submit the portfolio described below.

Program prerequisites are English composition, one semeter of calculus, two semesters of physics, and one semester each of the history of architecture, a general survey of architecture, and drawing. The required architecture courses may be taken after admission as a transfer student, but that may extend the time required for the degree.

The School of Architecture normally accepts transfer credits from regionally accredited four-year institutions. Transfer credits for technical and professional courses, however, are normally accepted only from institutions which are also accredited by the National Architectural Accrediting Board (NAAB).

Application Procedures. Exceptionally well-qualified students applying for early admission from high school should write the Director of Undergraduate Admissions, The University of Maryland, College Park, MD 20742. The deadline for such application is February 1. Earlier applications are encouraged.

Transfer students who have completed work at other colleges and universities should write the Director of Undergraduate Admissions, The University of Maryland, College Park, MD 20742. Students applying for admissions from pre-architecture or from other academic units of The University of Maryland College Park should contact the Director of Admissions, School of Architecture, The University of Maryland, College Park, MD 20742. Deadline for application for transfer student admission is February 1. A 3.0 GPA is normally recommended for admission to the School of Architecture. Detailed information is available from the School of Architecture.

In addition to the required high school and college transcripts, letters of recommendation, and other information, a portfolio of creative work must be submitted by all transfer and pre-architecture student applicants. The required portfolio of student work may include copies of drawings, photographs, and other evidence of creative work, submitted in 8½" × 11" format, for example, in a standard three-ring notebook. The portfolio should be submitted to the Director of Admissions, School of Architecture. (Please see the more detailed information in "Notice to Applicants for Admission to Architecture," available

from the School of Architecture.) The portfolio will be returned *only* if requested, in which case a self-addressed, stamped mailing envelope should be included with the portfolio for this purpose.

Curriculum Description and Requirements: Pre-Architecture. In the first two years of college, pre-architecture students should follow the following curriculum:

First Semester	
ENGL 101—Introduction to Writing	3
MATH 220—Elementary Calculus I	3
ARCH 170—Introduction to the Built Environment	3
USP (2 courses)	6
Total	15
Second Semester	
MATH 221—Elementary Calculus II (recommended)	3
USP (at least 3 courses)	10
Total	13
Third Semester	
PHYS 121—Fundamentals of Physics I	4
ARCH 222—History of Western Architecture	3
ARCH 242—Drawing I	2
USP (2 courses)	6
Total	15
Fourth Semester	
PHYS 122—Fundamentals of Physics II	4
USP (3 courses)	9
Total	13

Total Credits: 56

Curriculum Description and Requirements: Bachelor of Science, Major in Architecture. To qualify for admission to the baccalaureate degree program in architecture, students are required to complete 56 credits. In the final two years, students are expected to complete the following requirements for a total of 121 credits:

*First Semester**	
ARCH 302—Architecture Studio I	6
ARCH 375—Construction and Materials	3
ARCH 4xx—Arch. History/Area A**	3
USP	3
Total	15
Second Semester	
ARCH 303—Architecture Studio II	6
ARCH 460—Site Analysis	3
ARCH 343—Drawing II	2
ENGL 391—Advanced Composition	3
USP	3
Total	17
Third Semester	
ARCH 402—Architecture Studio III	6
ARCH 445—Visual Analysis of Architecture	3
ARCH 312—Architectural Structures I	3
ARCH 313—Thermal and Acoustical Technology	3
Total	15
Fourth Semester	
ARCH 403—Architecture Studio IV	6
ARCH 454—Theory of Urban Form	3
ARCH 412—Architectural Structures II	3
ARCH 415—Illumination, Electrical and Systems Technology	3
ARCH 4xx—Arch. History/Area B**	3
Total	18

Total Credits: 121

* Courses are to be taken in sequence as indicated by Roman numerals in course titles

** Architecture history courses: Area A, ARCH 422, 423, 432 and 436. Area B, ARCH 433, 434 and 420.

Curriculum Description and Requirements: Bachelor of Science, Major in Architecture/Urban Studies. In addition to programs leading to the professional degree in architecture, the School offers a Bachelor of Science degree with an urban planning focus, combining requirements of the School of Architecture and the Institute for Urban Studies. To enter this baccalaureate program, students must follow special application procedures for selective admission. Students are required to complete 56 credits. In the final two years, students are expected to complete the following requirements, providing a total of 120 credits.

First Semester	
ARCH 302—Architecture Studio I	6
Basic Field	6
Urban Studies	3
Total	15
Second Semester	
ARCH 303—Architecture Studio II	6
ARCH 460—Site Analysis	3
Urban Studies	3
ENGL 391—Advanced Composition	3
USP or Elective	3
Total	18
Third Semester	
ARCH 454—Theories of Urban Form	3
ARCH 450—Introduction to Urban Planning	3
ARCH 375—Construction and Materials I	3
Urban Studies	6
Total	15
Fourth Semester	
ARCH 453—Urban Problems Seminar	3
Urban Studies	6
Basic Field	3
USP or Elective	3
Total	15

Total Credits: 120

USP—University Studies Program Requirement (may also be used to satisfy major requirement)

NOTE: Urban studies requirements and basic field requirements must be approved for each candidate by the Institute for Urban Studies. All other requirements are approved by the School of Architecture.

Course Code Prefix—ARCH

College of Journalism

Professor and Dean: Cleghorn
Associate Dean: Kelly
Director of Undergraduate Studies: Theus
Professors: Blumler, Cleghorn, Crowell (Emeritus), Gurevitch, J. Grunig, Hiebert, Holman, Martin
Associate Professors: Barkin, Beasley, Franklin, Geraci, Levy, Sahin, Zanot
Assistant Professors: L. Grunig, Stepp
Lecturers: Greenfield, Kelly, Smith
Instructors: Kay, Paterson, Theus

The College of Journalism aa The University of Maryland stands at the doorstep of the nation's capital and the world's news center. It is an ideal location for the study of journalism, public relations, and mass communications because many of the world's important journalists, great news events, and significant communications activities are near at hand.

The College is within easy reach of four of the nation's top 20 newspapers, including the *Baltimore Sun*, the *Baltimore News-American*, the *Washington Post*, and the production offices of the *Wall Street Journal*. The College also has easy access to the Washington press corps—the large bureaus of the Associated Press, United Press International, *New York Times*, *Los Angeles Times*, and many other American and foreign newspapers, major networks and broadcasting news bureaus such as NBC, CBS, and ABC, many news, business, and special-interest magazines, and representatives of the book publishing industry.

The College is close to the sources of news, including the White House, executive departments and agencies, Supreme Court, and Congress. It is near many major non-governmental representative bodies such as associations, scientific and professional organizations, foreign representatives, and international agencies.

The College has six primary objectives: (1) to provide professional development, including training in skills and techniques necessary for effective communication, (2) to insure a liberal education for journalists and mass communicators, (3) to increase public understanding of journalism and mass communication, (4) to advance knowledge through research and publication, (5) to raise the quality of journalism through critical examination and study, and (6) to provide a continuing relationship with professional journalists and their societies.

The College is accredited by the Accrediting Council on Education in Journalism and Mass Communications. The College is a member of the Association of Schools of Journalism and Mass Communication and the Association for Education in Journalism and Mass Communication.

Student journalism organization chapters include the Society of Professional Journalists (Sigma Delta Chi), Kappa Tau Alpha, the Public

Relations Student Society of America, and The University of Maryland Advertising Club

The College maintains close relations with student publications, communications and media organizations including *The Diamondback*, the daily newspaper; *Eclipse*, minority student newspaper; *Terrapin*, yearbook; *Argus*, the monthly feature magazine; *Mitzpeh*, the Jewish student newspaper; and WMUC AM–FM, the radio station.

Students interested in participating in the internship program have their choice of more than 400 opportunities each semester to gain on-the-job training. A competitive summer internship program is also sponsored by the College.

Advanced journalism students have many opportunities for professional work in the journalism field. *Tuesday Weekly*, a student-produced live news show, is televised each week for cable television. News-editorial students must write for campus or community newspapers. In addition, advanced and graduate students often use the Washington, D.C. resources for both study and professional work experience. Some seminars meet in downtown Washington.

Students may seek an advisor's help in Room 2109, Journalism Building, the office of the Director of Undergraduate Studies, 454–2228.

The College offers sequences in advertising, broadcast news, public relations and news-editorial (which provides emphases in news reporting and editing, magazine writing, photojournalism, and science communication).

Admission to the College is competitive. Before applying for admission to the College, students who wish to become provisional majors in journalism must earn 28 credits, make at least a C in English 101 or its equivalent, pass a test of language skills and earn the grade point average (GPA) set by the College for admission. Provisional majors must earn at least a C in JOUR 201 and maintain the GPA set for provisional admission to gain full admission to the major. Contact the College for details of the selective admission process.

Typing ability of at least 30 words per minute is required of all students. Majors must earn a C or better in all journalism courses applied toward the degree. No more than 12 transfer credits may be approved by the College to apply toward the major. Regardless of transfer credits, at least one course within a chosen specialization must be taken in the College, e.g. JOUR 321, 322, 326, or 328, 330 or 331, 340 or 341, 350 or 351, 360 or 361, 371 or 487, 380 or 481.

Accredited journalism programs follow a policy which requires journalism majors to take about three-fourths of their coursework in areas other than journalism and related forms of communication. The College of Journalism follows this nationwide policy. In practical terms, this means that a journalism major may include no more than 30 credits of journalism and communications (such as radio-television-film or speech, with the exception of the required speech course in public speaking) among the 120 required for the undergraduate degree. If a student offers more than 120 credits for graduation, the number of journalism and communications credits may be higher.

Journalism majors may not minor in radio-television-film or speech.

Requirements for the Journalism Major. The requirements for graduation are given below.
See University Studies Program or General University Requirements in this catalog, whichever is applicable.

College Requirements:

1. MATH 110 or any more advanced course in finite mathematics.
2. Foreign language proficiency through the intermediate level. Three years of foreign language in high school does not automatically waive the foreign language requirement for the College of Journalism.

   OR

   Math Option to the Foreign Language Requirement. Instead of language, the student takes:
   - A. MATH 140, 150 or 220 or any MATH course for which any of these courses is prerequisite, except MATH 143.
   - B. One statistics course (SOCY 201, BMGT 230, BMGT 231, PSYC 200, MATH 111, EDMS 451, ECON 421, GVPT 422 or GEOG 305). Credit toward the degree will be given for the successful completion of only one of the above.
   - C. Computer Science 103 or 110.
3. A course in public speaking chosen from SPCH 100, 107, 200 or 230.
4. One of the following:
   - A. Sociology (recommended for public relations, advertising and science communication sequences or emphases). SOCY 100 or 105.
   - B. Anthropology, ANTH 101.
   - C. U.S. History (recommended for news-editorial sequence), HIST 156 or 157.
5. A course in principles of psychology, PSYC 100.
6. Economics—ECON 201, 203 or 205.
7. Government and Politics 170. For the news-editorial sequence, GVPT 260 or GVPT 460 are also recommended.

Specific Journalism Requirements

Each journalism major is required to fulfill the requirements in at least one of the following sequences. A sequence is an area of concentration which allows students to prepare themselves in depth for entry level professional employment. Students can arrange their programs to enable themselves to fulfill the requirements in more than one sequence.

News Editorial Sequence

	Credit Hours
JOUR 001—Professional Orientation	1
JOUR 201—Writing for the Mass Media	3
JOUR 202—Editing for the Mass Media	3
JOUR 320—News Reporting	3
JOUR 400—Law of Mass Communication	3
Any JOUR course numbered between 410 and 480	3
And completion of one of the following specializations:	
A. *News Specialization*	
Either JOUR 373—Graphics or JOUR 350—Photojournalism	3
Either JOUR 321—Advanced Reporting: Public Affairs or JOUR 322—Advanced Reporting: Beats and Investigations	3
At least one of the following:	
JOUR 323—Newspaper Editing	
JOUR 326—News Commentary and Critical Writing	
JOUR 328—Specialized News Reporting	
JOUR 371—Magazine Article and Feature Writing	
JOUR 380—Journalism for Science and Technology	3
Electives (JOUR 396 internship recommended)	6
B. *Magazine Specialization*	
JOUR 371—Magazine Article and Feature Writing	3
JOUR 373—Graphics	3
JOUR 487—Literary Journalism	3
JOUR 396—Internship	3
Electives	3
C. *Science Communication Specialization*	
JOUR 380—Journalism for Science and Technology	3
JOUR 371—Magazine Article and Feature Writing	3
JOUR 481—Advanced Science Writing	3
JOUR 396—Internship	3
Electives (JOUR 330 recommended)	3
D. *Photojournalism Specialization*	
JOUR 350—Photojournalism	3
JOUR 351—Advanced Photojournalism	3
JOUR 373—Graphics	3
JOUR 396—Internship	3
Electives	3
Minor in one field, upper division	12

Public Relations Sequence

JOUR 001—Professional Orientation	1
JOUR 201—Writing for the Mass Media	3
JOUR 202—Editing for the Mass Media	3
JOUR 330—Public Relations Theory	3
JOUR 331—Public Relations Techniques	3
JOUR 396—Supervised Internship	3
JOUR 480—Mass Communication Research	3
Advanced writing course (JOUR 320, 360, 371, or 380)	3
JOUR 400—Law of Mass Communication	3
Journalism electives (JOUR 333, 335 [483] and 350 recommended)	3
Minor in one field, upper division	12

Advertising Sequence

JOUR 001—Professional Orientation	1
JOUR 201—Writing for the Mass Media	3
JOUR 202—Editing for the Mass Media	3
JOUR 340—Advertising Communication	3
JOUR 341—Advertising Techniques	3
JOUR 396—Supervised Internship	3
JOUR 480—Mass Communication Research	3
JOUR 400—Law of Mass Communication	3
At least one additional journalism course numbered 410–480	3
Journalism electives (JOUR 330, 345 [484], 350, and 372 recommended)	3
Minor in one field, upper division (must be an approved field related to advertising)	12

Broadcast News Sequence

JOUR 001—Professional Orientation	1
JOUR 201—Writing for the Mass Media	3
JOUR 202—Editing for the Mass Media	3
JOUR 360—Broadcast News I	3
JOUR 361—Broadcast News II	3
JOUR 365—Theory of Broadcast Journalism	3
JOUR 400—Law of Mass Communication	3
At least one additional journalism course numbered 410–480	3
Journalism and Radio-TV-Film electives (chosen with permission of advisor)	9
Minor in one field, upper division (may not be in Radio-TV-Film)	12

Non-Journalism Requirements:

Twelve (12) credit hours in upper-division courses in one subject outside of the

College of Journalism. This is the minor.

Twenty-one (21) credit hours in upper-division, non-journalism electives, to be spread or concentrated according to individual needs. Minimum upper-division credits for graduation—57. Total lower and upper-division—120.

Course Code Prefix—JOUR

Arts and Humanities Departments, Programs and Curricula

American Studies

Associate Professor and Chairman: Kelly
Associate Professor and Undergraduate Coordinator: Mintz
Associate Professors: Caughey, Johns, Lounsbury
Assistant Professor: Diner
Lecturer: Keesing

The department offers an interdisciplinary focus on American culture and society in both historical and contemporary sources. Undergraduate majors, with the help of faculty advisors, design a program which includes courses offered by the American Studies faculty, and sequences of courses in the disciplines usually associated with American studies (i.e., history, literature, sociology, anthropology, political science, and others), or pertinent courses grouped thematically (e.g., Afro-American studies, women's studies, ethnic studies, comparative cultures, popular culture, urban and environmental studies, and so forth).

The major requires 45 hours, at least 24 of which must be at the 300-400 level. Of those 45 hours, 21 must be in AMST courses, with the remaining 24 in two 12-hour core areas outside the regular AMST offerings.

No grade lower than a C may be applied toward the major. The department recommends that students fulfill the Division's history requirement with an American history course, particularly if American history is not one of the core areas in the student's program. Lists of courses applicable to the major for each of the core areas are available from the departmental office. No courses other than those on the lists will be accepted for credit toward the major unless an advisor's permission has been granted in writing and placed in the student's file.

Distribution of the 45 Hours:

AMST Courses (21 hours required)

1. AMST 201—Introduction to American Studies (3): *required of majors.*
2. AMST 203—Popular Culture in America; AMST 205—Material Aspects of American Life; AMST 207—Contemporary American Cultures: three (3) hours minimum from this group, six (6) hours maximum may be applied toward the 21-hour AMST requirement.
3. AMST 330—Critics of American Culture (3): *required of majors.*
4. AMST 418—Cultural Themes in America; AMST 426—Culture and the Arts in America; AMST 428—American Cultural Eras; AMST 429—Perspectives on Popular Culture; AMST 432—Literature and American Society: *majors will take 6–9 hours (depending upon number of hours taken at 200 level) of these courses. No more than six (6) hours of a repeatable number may be applied to the major.* AMST 298, 498 (special topics); AMST 398 (independent study); or AMST 386–387 (internship) may sometimes be substituted for major requirements with advisor approval.
5. AMST 450—Seminar in American Studies (3): *required of majors.*

Core Areas Outside AMST (24 hours required):
Student majors will choose two outside core areas of 12 hours each. One of the core areas may be interdisciplinary in nature (see interdisciplinary core suggestions). All interdisciplinary cores *must* be approved by an advisor in writing; they may *not* be organized merely by grouping courses from the approved-course list.

Departmental Cores
Courses chosen from the approved list or accepted by an advisor in American History, American Literature, Sociology, Anthropology, Government and Politics, Psychology, Art History, Architecture, Geography, Radio-TV-Film, Economics, Education, Journalism, Philosophy

Interdisciplinary Cores
Afro-American Studies, Women's Studies, Urban and Environmental Studies, Popular Culture, Personality and Culture, Creative and Performing Arts, Comparative Cultures, Ethnic Studies, Business and Industry, Material Culture, Folklore

Individual cores may also be designed with advisor assistance and approval.

Course Code Prefix—AMST

Art

Professor and Chairman: Burnham
Professors: deLeiris (Emeritus), DiFederico, Denny, Driskell, Levitine (Emeritus), Lapinski, Miller, Morrison, Rearick, Stafford, Truitt
Associate Professors: Craig, DeMonte, Farquhar, Forbes, Gelman, Hargrove, Klank, Krushenick, Niese, Pogue, Spiro, Wheelock, Withers
Assistant Professors: Caswell, Kehoe, Kim, Merzlik, Richardson, Van Alstine, Venit
Lecturers: Gossage, Peters-Campbell
Slide Curator: Bonnell
Gallery Director: Wright (acting)

Two majors are offered in art: art history and studio. The student who majors in art history is committed to the study and scholarly interpretation of existing works of art, from the prehistoric era to our times, while the studio major stresses the student's direct participation in the creation of works of art.

In spite of this difference, both majors are rooted in the concept of art as a humanistic experience, and share an essential common aim: the development of aesthetic sensitivity, understanding, and knowledge. For this reason, students in both majors are required to progress through a "common curriculum," which will ensure a broad grounding in both aspects of art, then each student will move into a "specialized curriculum" with advanced courses in his own major.

A curriculum leading to a degree in art education is offered in the College of Education with the cooperation of the Department of Art.

Common Curriculum

Courses required in major unless taken as part of supporting area are listed below.
ARTH 100, Introduction to Art (3)
ARTH 260, History of Art (3)
ARTH 261, History of Art (3)
ARTS 100, Elements of Design (3)
ARTS 110, Elements of Drawing (3)

Specialized Curricula

Art History Major A
Five junior-senior level History of Art courses (a minimum of one each from at least three of the following areas: Ancient-Medieval, Renaissance-Baroque, 19th–20th century, non-Western) (15)
One additional Studio Art course, any level (3)
Supporting Area.
Twelve coherently related non-art credits approved by an advisor. Six of these credits must be taken in one department and must be at junior-senior level (12)

Art History Major B
Five junior-senior level History of Art courses (a minimum of one each from at least three of the following areas: Ancient-Medieval, Renaissance-Baroque, 19th–20th century, non-Western) (15)
Three additional courses in any level History of Art (9)
Supporting Area in Studio Art.
ARTS 100, Elements of Design (from common curriculum) (3)
ARTS 110, Elements of Drawing (from common curriculum) (3)
Two Studio Art courses at junior-senior level (6)

Total required credit hours for Art History Major A or B, combined major and supporting area—45

Studio Art Major A
ARTS 208, Intermediate Design or alternate course at 200 level or above (3)
ARTS 210, Intermediate Drawing (3)
ARTS 320, Elements of Painting (3)
ARTS 418, Advanced Drawing (3)
One course from the Elements of Sculpture Series (330, 334, 335) (3)
One course from the Elements of Printmaking series (340, 341, 342, 343, 344) (3)
One additional junior-senior level Studio course (3)
One advanced History of Art course (3)
Supporting Area
Twelve coherently related non-art credits approved by an advisor. Six of these credits must be taken in one department and must be at junior-senior level (12)

Studio Art Major B
ARTS 208, Intermediate Design or alternate course at 200 level or above (3)
ARTS 210, Intermediate Drawing (3)
ARTS 320, Elements of Painting (3)
ARTS 418, Advanced Drawing (3)
One course from the Elements of Sculpture Series (330, 334, 335) (3)
One course from the Elements of Printmaking series (340, 341, 342, 343, 344) (3)
One additional junior-senior level Studio Art course (3)
Supporting Area in History of Art
ARTH 260, History of Art (from common curriculum) (3)
ARTH 261, History of Art (from common curriculum) (3)

Two History of Art courses at junior-senior level (6)

Total required credit hours for Studio Art Major, combined major and supporting area—51 in Major A, 42 in Major B

No course with a grade less than C may be used to satisfy major requirements.

Course Code Prefixes—ARTE, ARTH, ARTS

Classics

Professor and Chairman: Rowland
Associate Professors Duffy, Hallett, Hubbe, Staley
Visiting Associate Professor: Perkell
Assistant Professor: Lee
Visiting Assistant Professor: Doherty
Instructors: Pittman, Shive

Classics is the study of the languages, literature, culture and thought of ancient Greece and Rome. At present students at Maryland may major in classical languages and literatures, with options in Greek, Latin or Greek/Latin combined, and enroll in a variety of courses on the classical world. In addition to the regular sequence of Greek and Latin courses, the Department offers Intensive Latin (LATN 120 and 220), Vocabulary Building (CLAS 280, 290), Greek and Roman Mythology (CLAS 170, 470), Greek and Latin Literature in Translation (CLAS 370, 371), Women in Greece and Rome (CLAS 320), Greek Tragedy (CLAS 374), and special topics courses (CLAS 309) on ancient education, ancient literature, ancient sports, etc. Courses on other classical subjects (history, art, philosophy, architecture) are taught by allied faculty on the Committee on Classical Studies.

Students who have had Latin in high school are encouraged to work at the highest level of which they feel capable. The departmental advisor will help students identify the appropriate courses in which to enroll. Normally students with less than one year of high school Latin take LATN 101. Those who enter with a full year of high school Latin register for LATN 102, with two full years, LATN 203. College credit is given to students who have earned a 3, 4, or 5 on the Advanced Placement test in Latin.

Major in Classical Languages, with three options: (A) Greek, (B) Latin, (C) Greek and Latin. Both option A and option B require a total of 30 credit hours, including 6 credit hours in the given language at the 200 level and 24 additional credit hours in upper level courses in the same language, of which at least 12 must be at the 400 level. A student who enters the program at the 300 level is excused from the 6 credits at the 200 level. Option C requires 12 hours of the second language in addition to the 30 hours of the first language. These 12 hours begin at the level which the Department judges appropriate to the student in virtue of previous training. A student with no previous training in the second language is allowed to count first year work in the second language toward the major requirement. Each option also requires 9 credit hours of supporting courses as follows: CLAS 170 (Greek and Roman Mythology), HIST 130 (The Ancient World), and one 300 level specialized course in Greek or Roman History (HIST 324, 325, 326, or 327). No course in the Latin language with a grade less than C may be used to satisfy major requirements.

Course Code Prefixes—CLAS, GREK, LATN

Communication Arts and Theatre

Professor and Chairman: Gillespie
Professors: Aylward, Bentley, Jamieson, Kolker, Meersman, Pugliese, Strausbaugh (Emeritus), Wolvin
Associate Professors: Falcione, Fink, Freimuth, Gomery, Kirkley, McCaleb, O'Leary, Totaro, Weiss
Assistant Professors: Blum, Carlson, Coleman, Elam, Kriebs, Parks, Patterson, Robinson, Shyles, Webster
Instructors: Brownlee, Donahue, Sincell, Tavares
Lecturers: Brown, Doyle, Macarthur, Niles (p.t.), Novelli (p.t.), Smith, Wilson

The departmental curricula lead to the Bachelor of Arts degree and permit the student to develop a program with emphasis in one of the three areas of the department: (1) speech communication (political communication, organizational communication, health communication, educational communication, and interpersonal communication); (2) theatre (history, design and performance; production in a liberal arts theatre program); (3) radio-television-film (broadcasting and film theory, production, history, criticism, and research in a comprehensive program). In cooperation with the Department of Curriculum and Instruction, the department provides an opportunity for teacher certification in the speech and drama education program.

The curriculum is designed to provide: (1) a liberal education through special study of the arts and sciences of human communication; (2) preparation for numerous opportunities in business, government, media and related industries, education, and the performing arts.

Since communication and theatre are dynamic fields, the course offerings are under constant review and development, and the interested student should obtain specific information about a possible program from a departmental advisor.

The major requirements are 30 hours of coursework in speech communication and radio-television-film, or 36 hours of coursework in theatre, exclusive of those courses taken to satisfy divisional requirements. Of the 30 hours, at least 15 must be upper level (300 or 400 series). No course with a grade less than C may be used to satisfy major requirements. For RTVF, this provision also applies to the supporting program.

Each of the possible concentrations in the department requires certain courses in order to provide a firm foundation for the work in that area.

Speech Communication

Required Major Courses (total of 30 credits): SPCH 200, 230, 356, 400 and 474. Three credits chosen from the following: SPCH 450, 471 or 435. Twelve semester credit hours in SPCH courses, at least nine of which must be at the 300–400 level.

Supporting Courses: 15 credit hours of supporting coursework selected in consultation with the major advisor.

Theatre

Required Core Courses for All Majors: THET 120, 170, 282, 330, 479, 490 and 491. For further requirements in the design or performing options and the supporting course requirements for each option, contact the major advisor.

Radio-Television-Film

Required Courses: RTVF 222 and either 223 or 314.

Supporting Courses: 15 graded credit hours of coherently related subjects, selected in consultation with an advisor and considering the personal goals of the student.

The department offers numerous specialized opportunities for those interested through co-curricular activities in theatre, film, television, and radio. For the superior student an Honors Program is available, and interested students should consult their adviser for further information no later than the beginning of their junior year.

Course Code Prefixes—SPCH, RTVF, THET

Comparative Literature Program

Program Director: Fuegi
Advisory Committee on Comparative Literature: Chairpersons of the Departments of English, French and Italian, Spanish and Portuguese, and Germanic and Slavic Languages.
Professors: Beck, Bentley, Best, Bryer, Damrosch, Freedman, Fuegi, Gillespie, Hering, Holton, Jones, MacBain, Oster, Panichas, Patterson, Rowland, Russell, Schoenbaum, Sosnowski
Associate Professors: Barry, Beicken, Caramello, Coogan, Fink, Flieger, Handelman, Hallett, Kerkham, Mintz, Peterson, Tarica, Russell
Assistant Professor: Felaco

Undergraduates may emphasize Comparative Literature as they work toward a degree in one of the departments of literature. Each student will be formally advised by the faculty of his "home" department in consultation with the Director of the Comparative Literature Program. In general, every student will be required to take CMLT 401 and CMLT 402. The various literature departments concerned will have additional specific requirements.

Students emphasizing comparative literature are expected to develop a high degree of competence in at least one foreign language.

Coursework may not be limited to the nineteenth and twentieth centuries.

LATN 170 is highly recommended for those contemplating graduate work in comparative literature.

Course Code Prefix—CMLT

Dance

Professor and Chairman: Wiltz
Professors: Madden (Emerita), L. Warren
Associate Professors: Rosen, Ryder, A. Warren
Instructors: Fleitell, Haigler, Mayes, Rutter
Lecturers: Butler (p.t.), Covey, Druker, Jackson

Recognizing that dance combines both athleticism and artistry, the dance program offers comprehensive technique and theory courses as a foundation for the dance professions. By developing an increasing awareness of the physical, emotional and intellectual aspects of movement in general, the student eventually is able to integrate his own particular mind-body consciousness into a more meaningful whole. To facilitate the acquisition of new movement skills, as well as creative and scholarly insights in dance, the curriculum provides a structured breadth experience at the lower division level. At the upper division level the student may either involve himself in various general university electives, or he may concentrate his energies in a particular area of emphasis in dance. Although an area of emphasis is not mandatory, many third and fourth year students are interested in studying a singular aspect of dance in depth, such as performance, choreography,

production/management, education or general studies (encompassing dance history, literature and criticism).

The dance faculty is composed of a number of distinguished teachers, choreographers and performers, each one a specialist in his or her own field. Visiting artists, throughout the year and during the summer, make additional contributions to the program. There are several performance and choreographic opportunities for all dance students, ranging from informal workshops to fully mounted concerts both on and off campus. Students may have the opportunity of working with Maryland Dance Theater or with Improvisations Unlimited, both in residence in the Department.

Students must complete 59 semester hours of dance credits. Of these, 18 hours of modern technique and four (4) hours of ballet technique are required. A minimum of 15 semester hours of dance must be taken at the upper level. Majors may not use more than 72 DANC credits toward the total of 120 needed for graduation. In addition to the 22 technique credits required, students *must* distribute the remaining 37 credits as follows:

Choreography I, II, III	9
Rhythmic Training	2
Improvisation	2
Dance Notation	3
Introduction to Dance	3
Movement Integration	2
Principles of Teaching	3
Dance History	3
Kinesiology for Dance	4
Dance Production	3
Philosophy of Dance	3

A grade of C or higher must be attained in all dance courses.

New, re-entering and transfer students are expected to contact the department following admission to the University for instructions regarding advising and registration procedures. Although entrance auditions are not required, some previous dance experience is highly desirable. Further information may be obtained from the Dance Department Student Handbook.

Course Code Prefix—DANC

English Language and Literature

Chairman and Professor: Cross
Professors: Bode (Emeritus), Bryer, Cooley (Emeritus), Damrosch, Dillon, Fleming (Emeritus), Freedman, Gravely (Emeritus), Holton, Hovey, Isaacs, Kenny, Kerrigan, Lawson, Lutwack (Emeritus), McWilliams, Mish (Emeritus), Murphy (Emeritus), Myers, Panichas, Patterson, Peterson, Russell, Salamanca, Schoenbaum, Vitzthum, Whittemore (Emeritus), Winton, Wittreich
Associate Professors: Barry, Bennett, Birdsall, Caramello, Carretta, Cate, Coletti, Coogan, Cooper, Donawerth, Flieger, Fraistat, Fry, D. Hamilton, G. Hamilton, Hammond, Handelman, Herman, Howard, Jellema, Joyce, Kleine, Mack, Marcuse, Miller, Pearson, C. Peterson, Robinson, Smith, Trousdale, Weber (Emeritus), Wilson
Assistant Professors: Auchard, Auerbach, Beauchamp, Coleman, David, Dobin, Dungey, Dunn, Fahnestock, James, Kornblatt, Leinwand, Levine, Loizeaux, Rutherford, Seidel, Slater, Van Egmond
Lecturer: J. Miller
Instructors: Buhlig, Demaree, Stevenson, Townsend

The English major requires 39 credits beyond the University composition requirement. For the specific distribution of these 39 credits, students should consult the English Department's advisors (Room A1122, ext. 2521). A student may pursue a major with emphasis in English and American Literature; Comparative Literature; English Language and Linguistics; or English Education (preparation for secondary school teaching). Students interested in secondary school teaching should inform the department as early in their college career as possible.

No course with a grade less than C may be used to satisfy major requirements.

In selecting supporting or elective subjects, students majoring in English, particularly those who plan to do graduate work, should give special consideration to courses in French, German, Latin, philosophy, history and the fine arts.

Honors. The Department of English offers an honors program, primarily for majors but open to others with the approval of the Departmental Honors Committee. Interested students should ask for detailed information from an English Department advisor no later than the beginning of the junior year.

Course Code Prefix—ENGL

French and Italian Languages and Literatures

Associate Professor and Chairman: Tarica
Professors: Bingham (Emeritus), MacBain, Therrien
Associate Professors: Black, Demaitre, Fink, Meijer, C.C. Russell
Assistant Professors: Hage, Felaco, Mossman, Rubin, Verdaguer
Instructors: Barrabini, Bondurant, C.P. Russell
Affiliate Assistant Professor: Jacoby

The undergraduate major in French consists of 36 hours of French courses at the 200 level and above. Two options, both having the same core, lead to the B.A. degree: (1) French language and literature, and (2) French language and culture. No grade lower than C may be used toward the major. Students intending to apply for teacher certification should consult the Director of Undergraduate Advising as early as possible for proper planning.

French Language and Literature Option. Required core courses: FREN 204, 250, 301, 351, 352, and one of 211, 311, 312, 404. Specialization: either 401 or 405, either 302 or 402, four additional 400-level courses (excluding 404, 475, 478, 479), of which three must be in literature. Additional requirements outside French: 12 credits in supporting courses chosen from a list approved by the department, or at least 12 credits (six credits at 200 level and six credits at 300–400 level) in one specific area, representing a coordinated plan of study.

French Language and Culture Option. Required core courses: FREN 204, 250, 301, 351, 352, and one of 211, 311, 312, 404. Specialization: one of 302, 401, 402, either 471 or 472, 473, three additional 400-level courses (excluding 404, 475, 478, 479). Additional requirements outside French: 12 credits in supporting courses chosen from a list approved by the department, or at least 12 credits (six credits at 200-level and six credits at 300–400 level) in one specific area, representing a coordinated plan of study.

Honors. The department offers an honors program in French for students of superior ability. Honors students must take a total of 36 credits in French, including 494H (preparation for the final comprehensive examination) and 495H (Honors Thesis). For further information see the Director of the French Honors Program.

Italian Language. While the department does not yet offer a major in Italian, Italian is one of the three component languages in the Romance Languages major, described below.

Course Code Prefix—FREN, ITAL

Germanic and Slavic Languages and Literatures

Acting Chairman and Associate Professor: Pfister
Professors: Best, Fuegi, Herin, Jones, Oster
Associate Professors: Beicken, Berry, Bilik, Fleck, Frederiksen, Glad, Hitchcock
Assistant Professors: Fagan, Merrill, Schallert, Strauch

Germanic Language and Literature

The undergraduate major in Germanic Language and Literature consists of 36 hours beyond the basic language acquisition sequence (GERM 101/102/104). No course completed with a grade lower than C may be used to satisfy the major requirements. Three program options lead to the B.A. degree: 1) German language, 2) German literature, and 3) Germanic area studies. Secondary concentration and supportive electives are encouraged in the other foreign languages, comparative literature, English, history, and philosophy. Majors intending to go on to graduate study in the discipline are urged to develop a strong secondary concentration in a further area of Germanic studies, such "internal minors" are available in German language, German literature, Scandinavian studies, and Indo-European and Germanic philology.

Major Requirements

German Language Option
Core: 220, 301, 302, and both 321 and 322. Specialization: 401, 403, 405 and four 300/400 level courses in Germanic languages and literatures.

German Literature Option
Core: 220, two further German language courses (301, 302, 401, 403, or 405); and 321, 322. Specialization: seven 400-level courses in German literature.

Germanic Area Studies Option
Core: 220, two further German language courses (301, 302, 401, 403, or 405); and 321, 322. Specialization: two upper-level courses in Germanic area studies (348, 358, 368, 381, 382, 383, 384, or 389) and five upper-level courses in a specialization, such as Scandinavian studies or Indo-European and Germanic philology.

Slavic Languages and Literatures

The undergraduate major in Slavic languages and literatures consists of 33 hours beyond the basic language acquisition sequences (SLAV 101/102/104). No course completed with a grade lower than C may be used to satisfy the major requirements. Secondary concentrations and supportive electives are encouraged in the other foreign languages, comparative literature, English, history, philosophy, and Russian studies.

Major Requirements
Four courses in advanced language (one from each set: 201–202, 301–302, 401–402, 403–404); the two-semester Survey of Russian Literature (321 and 322); five additional courses on the 400-level, no more than two of which may

be literature in translation.

Course Code Prefix—GERM, SLAV

Hebrew and East Asian Languages and Literatures

Associate Professor and Acting Chairman: Ramsey
Associate Professors: Berlin, Chin, Kerkham, Mintz, Sargent, Walton
Assistant Professor: Manekin
Instructors: Levy, Liberman

East Asian Languages and Literatures

Major. A student may major in East Asian languages and literatures with a concentration in Chinese or Japanese. Either concentration provides the training and cultural background needed for entering East Asia-related careers in higher education, the arts, business, government, international relations, agriculture, media, etc. Students may also want to consider a double major in East Asian languages and literatures and another discipline, such as business, international relations, economics, journalism, etc.

After completing the prerequisite of one year of language (12 credits): CHIN 101 (Elementary Chinese, six hours per week, fall), CHIN 102 (Elementary Spoken Chinese, three hours per week, spring), and CHIN 103 (Elementary Written Chinese, three hours per week, spring) *or* JAPN 101 (Elementary Japanese I, six hours per week, fall) and JAPN 102 (Elementary Japanese II, six hours per week, spring), students must complete 36 credits for the major course requirements (18 language, 6 civilization/history, 12 elective).

Chinese Course Requirements. *Language:* CHIN 201, 202, 203, 204, 301, 302. *Civilization/History:* Option 1—HIST 284 and 481 (or 485). Option 2—HIST 285 and 480, four electives at the 300 level or above in Chinese language, literature, linguistics, or other East Asian subjects, subject to the approval of student's advisor.

Japanese Course Requirements. *Language:* JAPN 201, 202, 203, 204, 301, 302. *Civilization/History:* Option 1—HIST 284 and 483, Option 2—HIST 285 and 482, four electives at the 300 level or above in Japanese language, literature, linguistics, or other East Asian subjects, subject to the approval of student's advisor.

Supporting Courses for Chinese or Japanese. Students are strongly urged to take additional courses in a discipline relating to their particular field of interest, such as linguistics, literary criticism, or comparative literature. The range of supporting courses can be decided upon in consultation with the student's advisor.

Special Language Courses. In addition to the more traditional courses in literature in translation, linguistics, and advanced language acquisition, courses in both Chinese and Japanese business language at the third-year level are offered. Students are also encouraged to spend at least one summer or semester in China (Taiwan or the People's Republic of China) or Japan in intensive language study under one or another of the University's exchange programs with foreign universities or at other approved centers of higher education.

Internship Program. This program allows students to gain practical experience by working in Washington/Baltimore area firms, corporations, and social service organizations that are East Asia-related, as well as in various branches of the federal government.

Hebrew Language and Literature

While the department does not yet offer a major in Hebrew language and literature, it does provide both beginners and those with previous study of the Hebrew language an opportunity to become conversant with the 3,000-year development of Hebrew language, literature, and culture.

Elementary and intermediate courses develop the ability to communicate effectively in modern Hebrew. Courses in composition and conversation emphasize vocabulary enrichment, grammar and syntax of the written and spoken language. On the advanced level the student analyzes the major texts of classical and modern Hebrew literature.

Courses are also offered in English on topics such as the Bible, Rabbinic Thought, Jewish Mysticism, Jewish Law, Ancient Near Eastern Civilization, Hebrew Literature in Translation, Women in Jewish Literature, and other Special Topics courses.

Hebrew may be used to fulfill the requirements of the Foreign Language Education curriculum of the Department of Secondary Education. Students wishing to emphasize Hebrew as a major subject may do so within the framework of the Jewish studies major. See the entry on the Jewish Studies Program or consult the Hebrew Office for requirements.

Course Code Prefix—CHIN, HEBR, JAPN, RLST

History

Professor and Chairman: Evans
Professors: Bauer (Emeritus), Belz, Berlin, Brush, Callcott, Cockburn, Cole, Duffy (Emeritus), Foust, Gilbert, Goodblatt, Gordon (Emeritus), Haber, Harlan, Henretta, Jashemski (Emerita), Kent, Lampe, McCusker, Merrill (Emeritus), A. Olson, K. Olson, Price, E. B. Smith, Sparks, Warren, Yaney
Associate Professors: Breslow, Darden, Eckstein, Farrell, Flack, Folsom, Friedel, Giffin, Grimsted, Gullickson, Harris, Hoffman, Holum, Kaufman, Majeska, Matossian, Mayo, Moss, Perinbam, Ridgway, Rozenblit, Spiegel, Stowasser, Weissman, Wright, Zilfi
Assistant Professors: Bradbury, Nicklason, Sumida, Williams
Adjunct: Carr, Papenfuse
Affiliate: Perry

The Department of History seeks to broaden the student's cultural background through the study of history and to provide preparation for those interested in law, publishing, teaching, journalism, government service, and graduate study.

A faculty advisor will assist each major in planning a curriculum to meet his personal interests. A "program plan," approved by the advisor, should be filed with the Department as soon as possible. Students are required to meet with an assigned advisor once every semester or sign a waiver during preregistration.

Major Requirements. Minimum requirements for undergraduate history majors consist of 39 hours of coursework distributed as follows: 12 hours in 100–200 level survey courses selected from at least two fields of history (United States, European, and Non-Western); 15 hours, including HIST 309 in one major area (see below); 12 hours of history in at least two major areas other than the area of concentration. Without regard to area, 15 hours of the 39 total hours must be at the junior-senior (300–400) level. *Note:* All majors must take HIST 309.

I. Survey Courses
1. The requirement is 12 hours at the 100–200 level taken in at least two fields.
2. Fields are defined as United States, European, and Non-Western history. All survey courses have been assigned to one of these fields. See departmental advisor.
3. In considering courses which will fulfill this requirement, students are encouraged to:
   a. select at least two courses in a sequence.
   b. select at least one course before A.D. 1500 and one course after A.D. 1500.
   c. sample both regional and topical course offerings.
4. Students will normally take survey courses within their major area of concentration.

II. Major Area of Concentration
1. The requirement is 15 hours including HIST 309 in a major area of concentration.
2. An area is defined as a series of related topical, chronological, or regional courses, such as:

Topical	Region	Country
History & Philosophy of Science	Latin American	Russia
Social	Middle Eastern	Britain
Intellectual	European	Continental Europe
Economic	United States	
Religious	Early Modern Europe	
Diplomatic	Medieval	
Women's History	Ancient	
Afro-American	East Asia	
Constitutional	African	
Jewish		

3. The major area may be chronological, regional or topical.
4. Students may select both lower and upper division courses.
5. A combination of chronological-topical courses or regional-topical courses is desirable.
6. The proseminar, HIST 309, should normally be taken in the major area of concentration.

III. Twelve Hours of History in at least Two Other Areas than the Area of Concentration.
1. Students may select either lower or upper division courses.
2. Students are encouraged to consider regional diversity.
3. Students are encouraged to take at least two elective courses in chronological periods other than that of their major area of concentration.

Grade of C or higher is required in each course included in the 39 required hours.

For students matriculating after December, 1979, credit may not be earned from the CLEP general history exam; for students matriculating after September 1, 1981, history credit may not be earned from any CLEP exam. Advanced Placement credit will be granted as elective, but will not apply toward major requirements.

Supporting courses. Nine credits at the 300–400 level in appropriate supporting courses, the courses do not all have to be in the same department.

The choice of courses must be approved in writing—before attempted, if possible—by the departmental advisor.

General University Requirements in History. All History courses on the 100, 200, 300 and 400 levels are open to students seeking to meet the University requirements in Area C (Division of Arts and Humanities) with the exception of HIST 214, 215, 309, 316, 317, 318. A few other courses are open only to students who satisfy specified prerequisites, but that does not limit them to history majors. It should be noted that special topics courses—HIST 219, 319 and 419—are offered on several different subjects of general interest each semester. Descriptions may be obtained from the History Department office.

Honors in History. Students who major or minor in history may apply for admission to the History Honors Program during the second semester of their sophomore year. Those who are admitted to the program substitute discussion courses and a thesis for some lecture courses and take an oral comprehensive examination prior to graduation. Successful candidates are awarded either honors or high honors in history.

The History Department offers pre-honors work in American history and in European history courses. Consult the *Schedule of Classes* for specific offerings each semester. Students in these sections meet in a discussion group instead of attending lectures. They read widely and do extensive written work on their own. Pre-honors sections are open to any student and are recommended for students in General Honors, subject only to the instructor's approval. Students who intend to apply for admission to the History Honor Program should take as many of them as possible during their freshman and sophomore years.

Course Code Prefix—HIST

Jewish Studies Program

Associate Professor and Director: Mintz
Professor: Goodblatt
Associate Professors: Berlin, Bilik, Handelman
Assistant Professor: Rozenblit
Instructors: Levy, Liberman

The Jewish Studies major provides undergraduate students with a framework for organized and interdisciplinary study of the history, philosophy, and literature of the Jews from antiquity to the present. Jewish Studies draw on a vast literature in a number of languages, especially Hebrew and Aramaic and includes the Bible, the Talmud, medieval and modern Hebrew literature. Yiddish language and literature comprise an important sub-field.

The undergraduate major requires 48 semester hours (24 hours minimum at 300-400 level) consisting of courses in the Hebrew Program and the History Department as well as other courses in the Departments of Germanic and Slavic Languages and Literatures, English, Geography, Philosophy and Sociology.

A minimum grade of C is required in all courses offered toward major requirements. A major in Jewish Studies will normally conform to the following curriculum:

1. Prerequisite: HEBR 111, 112, 211, 212 (or placement exam)
2. Required courses: HEBR 313, 314, HIST 282, 283, and either HIST 309 or research-oriented course in Hebrew approved by advisor (at 300 level or above); a Hebrew course in classical Jewish literature (200 level), and an additional upper level course in Hebrew literature *in Hebrew* (21 credit hours).
3. Electives: 15 credits in Jewish Studies courses in Hebrew language and literature, Jewish history, and Yiddish language and literature. At least 9 credits must be at the 300-400 level.
4. 12 credits of supporting courses in areas outside Jewish Studies such as history, sociology, philosophy, psychology, or literature, including at least 6 credits at the 300-400 level, to be selected with the approval of a faculty advisor.

Linguistics Program

Professor and Director: Lightfoot
Assistant Professor: Hornstein
Lecturer: Weinberg
Affiliate: McKay

The Linguistics Program offers courses on many aspects of language study and an interdisciplinary major leading to a B.A. Language is basic to many human activities and linguistics relates to many other disciplines which include work on language.

Work on language has provided one of the main research probes in philosophy and psychology for most of the 20th century. It has taken on a new momentum in the last 25–30 years and language research has proven to be a fruitful means to cast light on the nature of the human mind and on general cognitive capacity. Several courses focus on a research program which takes as a central question: How do children master their native language? Children hear many styles of speech, variable pronunciations and incomplete expressions, but, despite this flux of experience, they come to speak and understand speech effortlessly, instantaneously and subconsciously. Research aims to discover how this happens, how a person's linguistic capacity is represented in the mind, and what the genetic basis for it is. Students learn how various kinds of data can be brought to bear on their central question, how that question influences the shape of technical analyses.

The major program in Linguistics is designed for students who are primarily interested in human language per se, or in describing particular languages in a systematic and psychologically plausible way, or in using language as a tool to reveal some aspect of human mental capacities. Such a major provides useful preparation for professional programs in foreign languages, language teaching, communication, psychology, speech pathology, artificial intelligence (and thus computer work).

Major Requirements. Students obtain a B.A. in Linguistics by following one of two tracks, "Grammars and Cognition" or "Grammatical Theory and a Language". In each case, students take a common core of LING courses: LING 200, 240, 311–312, 321–322. Beyond this core, students must specialize by completing an additional 9 hours in LING plus one of the following: either 18 hours from selected courses in HESP, PHIL and PSYC, *or* 18 hours in a particular language. The specializations in detail are:

Grammars and Cognition
LING 440—Grammars and Cognition
Two 300/400 LING electives
PHIL 466—Philosophy of Mind
HESP 400—Speech and Language Development in Children
OR
HESP 498—Seminar in Psycholinguistics
PSYC 440—Introduction to Cognitive Psychology
OR
PSYC 422—Psychology of Language
Three 300/400 electives in HESP, PHIL, PSYC or CMSC

Grammatical Theory and a Language
LING 410/411—Grammars and Meaning/Comparative Syntax
OR
LING 420/421—Word Formation/Advanced Phonology
LING 300/400 elective
Five required courses in the language of specialization.
A course in the history or structure of the language of specialization.

When possible, the language of specialization should be the same as the one used to satisfy the Divisional Foreign Language Requirement. The specialization normally includes those courses which make up the designated requirement for a major in the chosen language. Special provision may be made for students who are native speakers of a language other than English and wish to conduct analytical work on the grammar of that language. A student may also study grammatical theory and English, the 18 hour concentration in English consists of courses in the history and structure of English to be selected in consultation with the student's Linguistics advisor.

For a double major, students need 27 credits in Linguistics, which normally include the LING courses for one of the two specializations.

Course Code Prefix—LING

Maryland English Institute

Director: Palmer
Instructors: Butler, Fiorito, Groff, Hughes, Kameraas Lanier, Liakos, Lipowitz, Porrer, Sahin, Salus, Sprague

The Maryland English Institute (MEI) offers special instruction in English to University of Maryland students who need to improve their competence in the language before they are able to undertake a full program of academic work. Two programs are offered—a half-time semi-intensive course and a full-time intensive course.

Semi-Intensive. This program is open only to University of Maryland students, both graduate and undergraduate, who fall within a TOEFL score range of 450—549. Candidates in this proficiency range may be admitted to The University of Maryland on a provisional basis, requiring them to satisfactorily complete the MEI Semi-intensive program in order to become full-time students. Classes meet two hours per day, five days per week during regular terms, four hours per day, five days per week during Summer Session II. In addition, students have two hours per week of assigned work in the language laboratory. The program is designed especially to perfect the language skills necessary for academic study at The University of Maryland. Enrollment is by permission of the Director and no credit is given toward any degree at the University.

Intensive. This full-time English-as-a-Foreign-Language program is open to non-native speakers of English who need substantial improvement in their English competence before they can undertake any academic study at a college or university in the United States. On the basis of an entrance examination, students will be assigned to classes at their particular proficiency levels. They will have four hours of English language instruction per day plus one hour of assigned work in the language laboratory, five days per week during the regularly scheduled semester and summer school sessions. The program is intended primarily for students who wish to enroll at The University of Maryland after completing their language instruction. However, satisfactory completion of the language program does not guarantee acceptance at the University. Enrollment is by permission of the Director and no credit is given toward any degree at the University.

Music

Professor and Acting Chairman: Traver
Associate Chairman and Lecturer: Cooper
Professors: Berman, Bernstein, Folstrom, Garvey, Guarneri String Quartet (Dalley, Soyer, Steinhardt, Tree), Head, Heim, Helm, Hudson, Johnson, Montgomery, Moss, Schumacher, Shirley, Troth, True
Associate Professors: Barnett, Davis, Delio, Elliston, Elsing, Fanos, Fleming, Gallagher, Gowen, Mabbs, McClelland, McDonald, Olson, Pennington, Robertson, Rodriques, Ross, Shelley, Wakefield, Wexler, Wilson
Assistant Professors: Gibson, Mangold, McCoy, Payerle, Sparks
Lecturers Beicken, McFarlane
Instructor: Walters

The objectives of the department are (1) to provide professional musical training based on a foundation in the liberal arts; (2) to help the general student develop sound critical judgment and discriminating taste in the performance and literature of music; (3) to prepare the student for graduate work in the field, and (4) to prepare the student to teach music in the public schools. To these ends, three degrees are offered: the Bachelor of Music, with majors in theory, composition, and music performance, the Bachelor of Arts, with a major in music; the Bachelor of Science, with a major in music education, offered in conjunction with the College of Education.

Music courses and private lessons are open to all majors who have completed the specified prerequisites, or their equivalents. Lessons are also available for non-majors, if teacher time and facilities permit. The University Bands, University Orchestra, University Chorale, University Chorus, Jazz Ensemble, and other ensembles, are likewise open to all qualified students by audition.

The Bachelor of Music Degree. Designed for qualified students with extensive pre-college training and potential for successful careers in professional music. Recommendation for admission is based on an audition before a faculty committee. A description of the audition requirements and prerequisites is available in the departmental office. A grade of C or above is required in all major courses.

Bachelor of Music (Perf.: Piano)
Sample Program

	Semester Credit Hours	
Freshman Year	*I*	*II*
MUSP 119/120	4	4
MUSC 128	2	2
MUSC 150/151	3	3
University Studies Program	6	6
	15	15
Sophomore Year		
MUSP 217/218	4	4
MUSC 228	2	2
MUSC 230		3
MUSC 250/251	4	4
University Studies Program	6	3
	16	16
Junior Year		
MUSP 315/316	4	4
MUSC 330/331	3	3
MUSC 328	2	2
MUSC 450	3	
Elective		2
University Studies Program	4	6
	16	17
Senior Year		
MUSP 419/420	4	4
MUSC 492		3
MUSC 467	3	
Elective	2	
University Studies Program	6	3
	15	10

The Bachelor of Arts Degree. Designed for qualified students whose interests include broader career alternatives. Recommendation for admission is based on an audition before a faculty committee. A description of the audition requirements, prerequisites, and program options is available in the departmental office. A grade of C or above is required in all major courses.

Bachelor of Arts (Music)
Sample Program

	Semester Credit Hours	
Freshman Year		
MUSP 109/110	4	
MUSC 150/151	6	
MUSC 129	2	
Electives, Division and USP Requirements	18	30
Sophomore Year		
MUSP 207/208	4	
MUSC 250/251	8	
MUSC 229	2	
Electives, Division and USP Requirements	16	30
Junior Year		
MUSP 305	2	
MUSC 330/331	6	
MUSC 450	3	
MUSC 329	1	
Electives, Division and USP Requirements	18	30
Senior Year		
Music Electives	10	
Electives, Division and USP Requirements	20	30
	120	120

Special Programs. The Department of Music actively cooperates with other departments in double majors, double degrees, and Individual Studies programs. Details are available on request.

Course Code Prefixes—MUSC, MUED, MUSP

Philosophy

Professor and Chairman: Slote
Professors: Gorovitz, Lesher, Pasch, Perkins, Stich, Suppe, Svenonius
Associate Professors: J. Brown, Celarier, Cherniak, Darden, Greenspan, Johnson, Levinson, Martin, Odell, Stairs
Assistant Professors: Tolliver, Wolf
Research Associates: Fullinwider, Lichtenberg, Luban, MacLean, Sagoff, Shue

The Department of Philosophy seeks to develop students' logical and expository skills and their understanding of the foundations of human knowledge and of value, in accordance with its conception of philosophy as essentially an activity rather than a body of doctrine. Thus in all courses students can expect to receive concentrated training in thinking clearly and inventively and in expressing themselves exactly about philosophical issues. This training has general applicability to all professions in which intellectual qualities are highly valued, such as law, medicine, government and business management. With this in view the major in philosophy is designed to serve the interests of those in the majority who are preparing for careers outside of philosophy as well as those in the minority who are preparing for graduate study in philosophy.

The following are among the courses giving the general student training in rigorous thinking, experience in critical and imaginative reflection on philosophical problems or familiarity with the philosophical foundations of Western and other cultures: PHIL 100 (Introduction to Philosophy), PHIL 110 (Plato's Republic), PHIL 142 (Ethics), PHIL 170 (Introduction to Logic), PHIL 173, PHIL 174 (Logic and the English Language I and II), PHIL 236 (Philosophy of Religion), and the historical courses: 310, 316, 320, 325, 326, 327, 328.

For students interested particularly in philosophical problems arising within their own special disciplines, a number of courses are appropriate: PHIL 233 (Philosophy in Literature), PHIL 250 and 453 (Philosophy of Science I and II), PHIL 245 and 445 (Social and Political Philosophy I and II), PHIL 360 (Philosophy of Language), PHIL 308B (Philosophy of Beauty), PHIL 308C (Philosophy of Art), PHIL 334 (Philosophy of Music), PHIL 438 (Topics in Philosophical Theology), PHIL 450 and 451 (Scientific Thought I and II), PHIL 452 (Philosophy of Physics), PHIL 454 (Philosophy of Economics), PHIL 455 (Philosophy of the Social Sciences), PHIL 456 (Philosophy of Biology), PHIL 457 (Philosophy of History), PHIL 458 (Topics in the Philosophy of Science, e.g. Philosophy of Psychology, Historical and Conceptual Foundations of Mathematics), and PHIL 474 (Induction and Probability).

Pre-law students may be particularly interested in PHIL 140 (Contemporary Moral Problems), PHIL 345 and 445 (Political and Social Philosophy I and II), and PHIL 447 (Philosophy of Law). Pre-medical students may be particularly interested in PHIL 342 (Moral Problems in Medicine), and PHIL 456 (Philosophy of Biology).

The Department's curriculum is enriched by courses in philosophy and public policy issues taught by research associates in the Center for Philosophy and Public Policy under the repeatable designations PHIL 308 (Studies in Contemporary Philosophy) and PHIL 408 (Topics in Contemporary Philosophy), cross-listed under similar headings in Government and Politics. Topics include such subjects as Business Ethics, Welfare and Distributive Justice, Responsibility of Professionals, Environmental Ethics and the Morality of Forced Military Draft.

The departmental requirements for a major in philosophy are as follows: (1) a total of at least 30 hours in philosophy, not including PHIL 100, (2) PHIL 142, 371, 310, 320, 326 and at least two courses numbered 399 or above, (3) a grade of C or better in each course counted toward the fulfillment of the major requirement.

Fifteen (15) hours of supporting courses are required.

Course Code Prefix—PHIL

Philosophy and Public Policy

Director: MacLean
Research Associates: Fullinwider, Lichtenberg, Luban, Sagoff, Segal, Shue

The Center for Philosophy and Public Policy conducts research into the values and concepts that underlie public policy formulation. Most research efforts—on topics expected to be a focus of public policy debate during the next decade—are conducted cooperatively by interdisciplinary working groups composed of philosophers, policymakers and analysts, other experts from within and without the government, and Center staff. In its research and curriculum development, the Center seeks to create an improved understanding of the normative principles that are basic to an assessment of public policies.

The Center's curriculum development seeks to bring philosophical issues before future policymakers and citizens. Courses dealing with contemporary normative issues in the national and international arena are offered through the Departments of Philosophy and of Government and Politics, and through the Honors Program. Courses which have been offered include: Hunger and Affluence, Human Rights and U.S. Foreign Policy, Distributive Justice and Public Policy, Philosophical Issues in Public Policy, The Morality of Compulsory Military Service, Environmental Ethics, Energy Policy and the Constraints of Justice, Ethics and the New International Order, Risk and Consent, and the Endangered Species Problem: A Philosophical Approach.

The Center is sponsored jointly by the Divisions of Arts and Humanities and of Behavioral and Social Sciences.

Renaissance and Baroque Studies

Director: Schoenbaum
Executive Director: Zimmerman

The Center for Renaissance and Baroque Studies promotes teaching and research in the Renaissance and Baroque periods in all disciplines of the arts and humanities, as well as in such allied fields as the history of science, the philosophy of science, and the history of law.

The Center's scholarly programs are designed primarily for faculty and graduate students, and include faculty conferences and colloquia, lectures and lecture-demonstrations by visiting speakers, concerts and other performances, exhibitions, and an annual Scholar-in-Residence program. The Center also sponsors programs of national significance, often in connection with area libraries, museums, and performing arts organizations. These events, which are open to the general public as well as to the academic community, include the annual Maryland Handel Festival and Symposium, and the Center's annual interdisciplinary symposium.

The Center is sponsored by the Division of Arts and Humanities, and is administered by its Director and Executive Director in conjunction with an Advisory Board of outside consultants, and a faculty Advisory Committee of representatives from 15 departments in Arts and Humanities.

Romance Languages Program

Advisory Committee: Russell (Italian), Chair, Gramberg (Spanish), Black (French)

The Romance Language Program is intended for students who wish to major in more than one romance language. Students selecting this major must take a total of 45 credits selected from courses in two of the three components listed below: French, Italian and Spanish. The first four courses listed under each group are required for that particular language component, exceptions or substitutions may be made only with the approval of the student's advisor in consultation with the Romance Language Advisory Committee. To achieve the total of 45 credits, 21 credits are taken in each of the two languages, as specified, and three additional credits are taken at the 400 level in either of the languages chosen. There are no requirements for support courses for the romance language major. No grade lower than C may be used toward the major. Students who wish to apply for Teacher's Certification should consult the College of Education.

Requirements for each language are as follows: *French*—204, 301, 351, 352, one additional language course at the 300 or 400 level, two additional literature or civilization courses at the 400 level. *Italian*—204, 301, 351, 352; three additional literature or civilization courses at the 400 level. *Spanish*—204, 301, 321–322 or 323–324, one additional language course at the 300 or 400 level, two additional literature or civilization courses at the 400 level.

Russian Area Studies Program

Associate Professor, Director and Student Advisor: Lampe
Professors: Harper (Geography), Foust, Yaney (History)
Associate Professors: Murrell (Economics), Majeska (History), Berry, Brecht, Glad, Hitchcock (Slavic), Parming (Sociology)
Assistant Professors: Oliver (Government and Politics), Merrill, Schallert (Slavic)
Instructor: Brin

The Russian Area Studies Program offers courses leading to a B.A. in Russian studies. Students in the program study Russian and Soviet culture as broadly as possible, striving to comprehend it in all its aspects rather than focusing their attention on a single segment of human behavior. It is hoped that insights into the Russian way of life will be valuable not only as such but as a means to deepen the students' awareness of their own society and of themselves.

Course offerings are in several departments: language and literature, government and politics, history, economics, geography, philosophy, and sociology. A student may plan his or her curriculum so as to emphasize any one of these disciplines, thus preparing for graduate work either in the Russian area or in the discipline.

Students in the program must meet the general degree requirements of the University and division from which they graduate. They must complete 12 hours of basic courses in Russian language normally through SLAV 104 or the equivalent of these courses taken elsewhere, and they must complete at least 12 more hours in Russian language beyond the basic level (chosen from among SLAV 201, 202, 301, 302, 321, 322, 401, 402 and 403 or equivalent courses). In addition, students must complete 24 hours in Russian area courses on the 300 level or above. These 24 hours must be taken in at least 5 different departments, if appropriate courses are available, and may include language-literature courses beyond those required above.

It is recommended but not required that the student who plans on doing graduate work complete at least 18 hours at the 300 level or above (which may include courses applicable to the Russian Area Program) in one of the above-mentioned departments. It is also recommended that students who plan on doing graduate work in the social sciences—government and politics, economics, geography, and sociology—take at least two courses in statistical methods.

The student's advisor will be the program director or his designate. The student must receive a grade of C or better in all the above-mentioned required courses.

In addition to the courses in Russian language, literature and culture taught in the Department of Germanic and Slavic Languages and Literatures, the following Russian Area courses are regularly offered:

ECON 380—Comparative Economic Systems
ECON 482—Economics of the Soviet Union
GEOG 325—Soviet Union
GVPT 445—Russian Political Thought
GVPT 451—Foreign Policy of the U.S.S.R.
GVPT 481—Government and Administration of the Soviet Union
HIST 305—The Eastern Orthodox Church: Its Cultural History
HIST 340—Eastern Europe Under Communism
HIST 344—The Russian Revolutions of 1917
HIST 424—History of Russia to 1801
HIST 425—History of Russia from 1801–1917
HIST 442—The Soviet Union
HIST 443—Modern Balkan History
PHIL 328—Studies in the History of Philosophy
SOCY 474—Soviet Ethnic Issues

The various cooperating departments also offer occasional special courses in the Russian and Soviet field.

HIST 237, Russian Civilization, is recommended as a general introduction to the program but does not count toward the fulfillment of the program's requirements.

Course Code Prefix—SLAV

Spanish and Portuguese Languages and Literatures

Professor and Chairman: Sosnowski
Professors: Gramberg, Marra-Lopez, Nemes, Pacheco
Visiting Professor: Martinez
Associate Professors: Diz, Igel
Assistant Professors: Aguilar-Mora, Kristal, Zappala
Instructors: Garcia, Rentz

Majors. Undergraduate majors can benefit from a wide range of courses in Spanish and Latin American literature and civilization, technical courses in translation, linguistics and commercial uses of Spanish. Area studies programs are also available in conjunction with other disciplines in order to provide the student with a solid knowledge of the Spanish and Latin American worlds. The major in literature prepares the student for graduate studies in Spanish and opportunities in various fields of study and work.

A grade of at least C is required in all major and supporting area courses.

Language and Literature Major. Courses: SPAN 204, 221, 301–302, 311 or 312, 321–322 or 323–324, 425–426 or 446–447, plus four 400-level courses or pro-seminars in literature: Spanish, Spanish American, or Luso-Brazilian, for a total of 39 credits. Nine credits of supporting courses, six of which must be on the 300 or 400 level in a single area other than Spanish, for a combined total of 48 credits. Suggested areas: art, comparative literature, government and politics, history, philosophy and Portuguese. All supporting courses should be germane to the field of specialization.

Foreign Area Major. Courses: SPAN 204, 301–302, 311 or 312, 315, 316 or 317, 321–322 or 323–324, 425–426 or 446–447, plus three 400-level courses in literature: Spanish, Spanish American, or Luso-Brazilian, for a total of 36 credits. Twelve credits of supporting courses, six of which must be on the 300 or 400 level in a single area other than Spanish, for a combined total of 48 credits. Suggested areas: anthropology, economics, geography, government

and politics, history, Portuguese, and sociology. All supporting courses should be germane to the field of specialization.

Translation Option. Courses SPAN 301–302, 311 or 312, five courses from 316, 317, 318, 356, 357, 416, 417, 321–322 or 323–324, one course from 425, 426, 446, 447, plus two 400-level courses or pro-seminars in Spanish, Spanish American, or Luso-Brazilian literature, for a total of 39 credits. Nine credits of supporting courses, six of which must be on the 300 or 400 level in a single area other than Spanish, for a combined total of 48 credits. Suggested areas: art, comparative literature, government and politics, history, philosophy, and Portuguese.

Students interested in majoring in a combination of two Romance languages should see the description of the Romance Languages Program, above.

Honors in Spanish. A student whose major is Spanish and who, at the time of application, has a general academic average of 3.0 and 3.5 in his major field may apply to the Chairman of the Honors Committee for admission to the Honors Program of the department. Honors work normally begins the first semester of the junior year, but a qualified student may enter as early as the sophomore year or as late as the second semester of the junior year. Honors students are required to take two courses from those numbered 491, 492, 493, and the seminar numbered 496 or equivalent, as well as to meet other requirements for a major in Spanish. There will be a final comprehensive examination covering the honors reading list which must be taken by all graduating seniors who are candidates for honors. Admission of students to the Honors Program, their continuance in the program, and the final award of honors are the prerogative of the Departmental Honors Committee.

Elementary Honors. SPAN 102H is limited to specially approved candidates who have passed SPAN 101 with high grades, and will allow them to enter 203H. SPAN 203H is limited to students who have received high grades in 102, 102H or 103 or the equivalent. Upon completion of 203H, with the recommendation of the instructor, a student may skip 204.

Lower Division Courses. The elementary and intermediate courses in Spanish and Portuguese consist of three semesters of four credits each (101, 102, 203). The language requirement for the B.A. degree in the Division of Arts and Humanities is satisfied by passing 203 or equivalent.

Students who have had two years of Spanish in high school should enroll in SPAN 103. Those with three years should enroll in SPAN 203, and those with four years in SPAN 203H or higher.

Transfer students with college credit have the option of continuing at the next level of study, taking a placement examination, or electing courses 103 or 203. If a transfer student takes course 103 for credit, he retains transfer credit only for the equivalent of course 101. A transfer student placing lower than his training warrants may ignore the placement but *does so at his own risk*. If he takes 203 for credit, he retains transfer credit for the equivalent of courses 101 and 102.

If a student has received a D in a course, advanced and completed the next higher course, he cannot go back and repeat the original course in which he received a D. A student who has earned credits for Spanish 204 may not subsequently earn credit for any lower level course.

Course Code Prefixes—SPAN, PORT

Women's Studies Program

Director: Beck
Faculty: Moses, Pratt
Part-time Lecturers: Biren, Strasburg, Zeiger

Women's Studies is an interdisciplinary academic program in the Division of Arts and Humanities which is designed to provide students with an academic balance to traditional curricula which have ignored or distorted the role of women in society. To this end, the program promotes research on women, facilitates the introduction of research findings on women into all relevant university courses, offers core courses on women, and encourages the offering of courses on women in other departments and programs. Among the many departments that offer courses on women are: Afro-American Studies, American Studies, English, the Foreign Languages, Government, Health, History, Psychology, and Sociology.

Women's Studies courses provide a critical analysis of sex-biased theories and methodologies current in major disciplines and encourage the study of the contributions of women. The Women's Studies Program is committed to promoting education free, not only from sexism, but also from racism, anti-semitism, class bias, ageism, heterosexual bias, and all the ideologies and attitudes which constrict our understanding of reality. Women's Studies offers the following core courses:

WMST 200: Introduction to Women's Studies
WMST 250 Women, Art, and Culture
WMST 298: Special Topics in Women's Studies
WMST 386/387: Field Work/Field Work Analysis
WMST 400: Theories of Feminism
WMST 498 Special Topics in Women's Studies
WMST 498D/498E Feminist Education Practicum/Feminist Education Analysis
WMST 499 Independent Study

The Women's Studies Certificate Program. Students may earn a Women's Studies Certificate by completing 21 credits selected from required women's studies core courses and electives chosen according to the student's interests. Any student in good standing in a division of the University may enroll in the certificate program by signing up with the women's studies undergraduate advisor. For a description of this certificate, see "Campus-Wide Programs and Certificates."

Division of Behavioral and Social Sciences

Provost: Polakoff

The Division of Behavioral and Social Sciences is comprised of a diverse group of disciplines that emphasize a broad liberal arts education as a foundation for understanding the environmental, social and cultural forces that shape our world. At the heart of the behavioral and social sciences is the attempt to understand human beings, both individually and in groups; this understanding is developed using approaches that range from the scientific to the philosophical, from the experimental to the theoretical. The greatest strength of the behavioral and social sciences, however, is that the *techniques* of problem-solving are taught within the context of strong academic skills. This provides students with the intellectual breadth necessary to understand the world around them, and with the skills necessary to think analytically and critically, and to speak and write clearly and persuasively.

Students interested in human behavior and in solving human and social problems will find many exciting opportunities through the programs and courses offered by the Division of Behavioral and Social Sciences. The Division is composed of the following academic units:

School of Public Affairs
College of Business and Management
Afro-American Studies Program
Department of Anthropology
Bureau of Business and Economic Research
Center for Philosophy and Public Policy
Center for International Development
Department of Economics
Division Computer Laboratory
Department of Geography
Department of Government and Politics
Department of Hearing and Speech Sciences
Industrial Relations and Labor Studies Center
Institute for Urban Studies
Institute of Criminology and Criminal Justice
Department of Psychology
Department of Sociology
Survey Research Center

All of these units, with the exception of the Bureau, Centers, and the Division Computer Laboratory, offer major programs which lead to a degree. Each has faculty assigned to serve as academic advisors.

Pre-professional training and professional opportunities in the behavioral and social sciences are available in many fields. The College of Business and Management offers programs in accounting, finance, management science, marketing, production management, transportation, and personnel and labor relations. The Department of Hearing and Speech Sciences offers training for students interested in careers as speech pathologists. Students interested in urban planning will find academic and professional training through courses offered by the Institute for Urban Studies, the Department of Geography, and the Afro-American Studies Program. Students may choose government and politics, criminal justice and criminology, or sociology for preparation for careers in the law and related fields. The internship programs offered by many departments in the Division provide students with practical experience working in governmental agencies, nonprofit organizations, corporations and research centers.

The Division believes strongly in the importance of computer training as a necessary part of undergraduate education in the behavioral and social sciences. The Division Computer Laboratory provides undergraduate students in the Division with the facilities and staff assistance to satisfy a wide range of computer-related needs. The laboratory's facilities include a DEC PDP computer, access to the campus UNIVAC and IBM computers, a Prime 550 computer, a micro-computer class-laboratory, and classrooms of terminals for both in- and out-of-class student use.

Entrance Requirements. Requirements for admission to the Division are the same as the requirements for admission to the University. The College of Business and Management does have a selective admissions policy. For further information, see the description of the College's programs.

Degrees. The University confers the following degrees as appropriate, on students completing programs of study in the academic units in the Division: Bachelor of Arts, Bachelor of Science, Master of Applied Anthropology, Master

of Arts, Master of Science, Master of Public Management, Master of Public Policy, Master of Business Administration, and Doctor of Philosophy. Each candidate for a degree must file in the Office of Records and Registrations, prior to a date announced for each semester, a formal application for the appropriate degree.

Graduation Requirements. Each student must complete a minimum of 120 hours of credit with at least a 2.0 cumulative average. Courses must include either the 30 hours specified by the General University Requirements or the credits required in the University Studies Program, and the specific major and supporting course requirements of the College of Business and Management or of the programs in the academic departments offering baccalaureate degrees.

General Information and Student Advisement. The BSOS Undergraduate Advising Office (Room 2115 Tydings Building) coordinates advising and maintains student records for BSOS students not in the College of Business and Management. Divisional advisors are available to provide information concerning University requirements and regulations, transfer credit evaluations and other general information about the University.

Undergraduate departmental advisors are designated for each major. These advisors are available to assist students in selecting courses and educational experiences in their major area of study consistent with major requirements and students' educational goals. These undergraduate advisors are located at the various departmental/unit offices.

Admission to the College of Business and Management is competitive at the junior level, except for a small number of academically talented freshmen. Students who are admitted to the University with an interest in business but who do not meet the requirements for admission to the College are admitted to the Division as "pre-business." Advisement for pre-business majors is available in the BSOS Undergraduate Advisement Office, Room 2115, Tydings Hall.

General advisement in the College of Business and Management is available through the Director of Undergraduate Studies in Room 2136, Tydings Hall.

The Division maintains a Learning Center in LeFrak Hall which provides individual tutoring for students. The Center is staffed by retired professionals, graduate and undergraduate students.

Honors. Undergraduate Honors Programs are offered in the College of Business and Management, the Departments of Anthropology, Economics, Geography, Government and Politics, Psychology and Sociology, and in the Institutes of Criminal Justice and Criminology and Urban Studies.

Any student who has passed at least 12 hours of academic work in the preceding semester, without failure of any course and with an overall average grade of at least 3.5 will be placed on the Provost's List of Distinguished Students.

Senior Residence Requirements. All candidates for degrees should plan to take their senior year in residence since the advanced work of the major study normally occurs in the last year of the undergraduate course sequence. The last 30 credits must be done in residence. A student must be enrolled in the Division from which he/she plans to graduate when registering for the last 15 credits of his or her program.

School of Public Affairs

Professor and Dean: Eads
Professors: Bowker, Brown, Kelleher, Levy, Schick, Young
Associate Professor: Nacht
Assistant Professors: Houseman, Winer
Lecturer: Slater
Faculty Research Associate: Cohen
Faculty Research Assistant: Harbour

The School of Public Affairs provides *graduate-level,* professional education to men and women of distinction of both mind and character. Five disciplines are emphasized: accounting, statistics, economics, politics, and ethics. Students specialize in issues of government/private sector interaction, international security, or public sector financial management. The program is open to pre-career and mid-career graduate students and builds on the School's location in the Baltimore/Washington corridor.

The School offers two degrees: the Master of Public Management (MPM) and the Master of Public Policy (MPP). The School also offers joint degree programs with the College of Business and Management (MPM/MBA) and the School of Law (MPM/JD). In addition, several certificates are offered.

Master of Public Management. The MPM is a two-year, 54-credit, full-time professional degree, combining a rigorous applied course of study with practical, hands-on experience.

About 35 students enter the program each fall. Although this number is small, candidates come from a wide variety of undergraduate schools and majors. During the first year, students fulfill the core requirements which emphasize the tools of policy analysis: accounting, statistics, economics, politics, and ethics. In addition they are introduced to the policymaking process and future job contacts through structured interviews with national policy makers. Except for an elective course option during the second semester, first-year students take all of the core requirements together.

During the summer between the first and second years, students obtain employment in federal, state or local government agencies or in units of private firms which deal with government agencies. In addition to gaining practical experience and utilizing the skills acquired during the first year, this opportunity provides contacts and relationships useful for future projects and job placement.

During the second year, students specialize in one of three concentrations: Public Policy and Private Enterprise, Public Sector Financial Management, or National Security Policy. They also complete their core curriculum requirements by taking Macro-Economics Theory and Policy Analysis.

Each concentration requires participation in a project course. Students, working individually or in small groups, conduct research at sponsoring government agencies or private firms on problems of interest to the sponsor and themselves.

Master of Public Policy. The MPP is a 36-credit degree program designed for mid-career students. This degree recognizes that individuals at the mid-state of their careers need to update their knowledge of today's complex public issues in order to move into positions of greater authority and responsibility.

The typical MPP candidate has worked in the public or public-related sector for a minimum of three years and is capable of handling a rigorous academic program as well as excelling in his/her professional career. The candidates enter the School with varied academic as well as professional backgrounds. Most have a minimum of a 3.0 from their undergraduate school with some college level math and economics. Admission of candidates without these courses in their background is contingent upon the successful completion of appropriate coursework.

The MPP degree consists of two components: the core curriculum in Methods of Policy Analysis and a selected area of concentration in Public Sector Financial Management, Public Policy and Private Enterprise, or National Security Policy.

The courses are typically offered in the early morning or late afternoon. It is expected that the program will be completed in a maximum of three years with all students taking two courses each fall and spring semester.

Certificate Programs. The School offers Certificate Programs in four areas: Methods of Policy Analysis, Public Policy and Private Enterprise, Public Sector Financial Management, and National Security Policy. Each program consists of 18 credits (six courses) and should be completed in a maximum of three semesters.

Further information can be obtained by calling Mrs. Lyn Chasen, 454–7238.

College of Business and Management

Professor and Dean: Lamone
Professor and Associate Dean: Carter
Assistant Dean: Brown
Associate Professor and Director of Doctoral Program: Alt
Director of the Masters' Programs: Waikart
Director of Undergraduate Studies: Mattingly
Assistant Director of Undergraduate Studies: Zager
Professors: Bartol, Bodin, Bradford, Carroll, Dawson, Gannon, Gass, Golden, Gordon, Greer, Haslem, Jolson, Kolodny, Kotz, Leete, Levine, Locke* (Psychology), S. Loeb, Masi (affiliated), Polakoff* (Economics), Preston, Simon, Taff
Associate Professors: Assad, Ball, Bedingfield, Chen, Corsi, Courtright, Edelson, Edmister, Fromovitz, Hynes, M. Loeb, Nickels, Poist, Schneiderman (affiliated), Schneier, Spekman, Widhelm, Yao
Assistant Professors: Ahad, Barbera, Christofi, Eun, Goldenberg, Grimm, Hevner, Holcomb, Huss, Kraptel, Mattingly (affiliated), Meisinger (affiliated), Olian, Power, Roussopoulis (affiliated), Shick, K. Smith, R. B. Smith, Soubra, Stark, Stephens (visiting), Sutton, Trader, Taylor, Wardlow
Lecturers (full-time): Basu, Everett, Odle, Zieha
Lecturers (part-time): Borra, Black, Dahl, Donahue, Embersit, Fischetti, Gandhi, Garbuny, Gardner, Hardy, Harman, Harris, Hicks, Hirsch, Kovach, Lynagh, Manchester, McLaughlin, Pantalone, Pearce, Quigley, Roseckv, Rymer, Spear, Swope

* *Joint appointment with unit indicated.*

The College of Business and Management recognizes the importance of education in business and management to economic, social, and professional development through profit and nonprofit organizations at the local, regional, and national levels. The faculty of the College have been selected from the leading doctoral programs in business. They are scholars, teachers, and professional leaders with a commitment to superior education in business and management. The College is one of two business schools in Maryland accredited by the American Assembly of Collegiate Schools of Business, the official national accrediting organization for business schools.

The College has faculty specializing in accounting, finance, management science and statistics, marketing, organizational behavior and industrial relations, and transportation, business and public policy.

Undergraduate Program. The undergraduate program recognizes the need for professional education in business and management based on a foundation

in the liberal arts. Modern society comprises intricate business, economic, social, and government institutions requiring a large number of men and women trained to be effective and responsible managers The College regards its program leading to the Bachelor of Science in business and management as one of the most important ways it serves this need

A student in business and management selects a major in one of several curricula (1) accounting; (2) finance, (3) general curriculum in business and management; (4) management science-statistics statistics option, decision and information sciences option, and management science option, (5) marketing, (6) personnel and labor relations, (7) production management and, (8) transportation. For students interested in law as a career there is a combined business and law program. (The Bachelor of Science degree in one of the above curricula is awarded after 90 semester hours and one year at The University of Maryland School of Law. See specific requirements at the end of curricula section below)

Students interested in insurance, real estate, or international business may plan with their advisors to select elective courses to meet their specialized needs, however, this interest is in addition to completion of one of the above majors

At least 45 hours of the 120 semester hours of academic work required for graduation must be in business and management subjects. *A minimum of 57 hours* of the required 120 hours must be in 300 or 400 level courses In addition to the requirement of an overall cumulative grade point average of 2.00 (C average) in all College Park coursework, an average of C in business and management subjects is required for graduation. Electives in the curricula of the College may be taken in any department of the University if the student has the necessary prerequisites. Business courses taken as electives may not be taken on a pass/fail basis by students of the College of Business and Management.

Degrees. The University confers the following degrees on students successfully completing programs of study in the College Bachelor of Science (B.S.), Master of Business Administration (M.B.A.), Master of Science (M.S.); Doctor of Philosophy (Ph.D.). Each candidate for a degree must file in the Office of Records and Registrations, prior to a date announced for each semester, a formal application for a degree. Information concerning admissions to the M.B.A. program is available from the College's Director of the Masters' Programs.

Academic Advisement. General advisement in the College of Business and Management is available Monday through Friday in the Office of Undergraduate Studies in Room 2136, Tydings Hall (telephone 454–4314) It is recommended that students visit this office each semester to ensure that they are informed about current requirements and procedures. Student problems concerning advisement should be directed to the Director of Undergraduate Studies.

Transfer students entering the University can be advised during spring, summer and fall transfer orientation programs. Contact the Orientation Office for further information (telephone 454–5752).

General advisement of pre-business students is available in the BSOS Undergraduate Advisement Office, in Room 2115, Tydings Hall (telephone 454–2301).

Entrance Requirements. Admission to the College is on a competitive basis at the junior level, except for a small number of academically talented freshmen. In order to be admitted as a junior, an applicant must have earned at least 56 semester credits, completed the required pre-business courses (i.e., freshman-sophomore core requirements), and meet the competitive accumulative grade point average (GPA) in effect for the semester for which he/she is applying. This GPA will always be between 2.3 and 3.0 (on 4.0 scale); however, for Spring 1986 this competitive accumulative GPA was set at 2.7. All coursework completed at UMCP and other colleges counts toward the computation of the cumulative GPA for Business College Admission regardless of whether the courses have been accepted for transfer credit to UMCP

Students who are admitted to the University with an interest in business but who do not meet the requirements for admission to the College are designated as "pre-business" majors in the Division of Behavioral and Social Sciences (BSOS).

Statement of Policy on the Transfer of Credit from Community Colleges. The College of Business and Management subscribes to the policy that a student's undergraduate program below the junior year should include no advanced, professional level courses. This policy is based on the conviction that the value derived from these advanced courses is materially enhanced when based upon a sound foundation in the liberal arts.

In adhering to the above policy, it is the practice of the College of Business and Management to accept in transfer from a regionally accredited community college no more than 12 semester hours of work in business administration courses. The 12 semester hours of business administration acceptable in transfer are specifically identified as three (3) semester hours in an introductory business course, three (3) semester hours in business statistics, and six (6) semester hours of elementary accounting. Thus, it is anticipated that the student transferring from another regionally accredited institution will have devoted the major share of his academic effort below the junior year to the completion of basic requirements in the liberal arts. A total of 60 semester hours may be transferred from a community college and applied toward a degree from the College of Business and Management.

Statement of Policy on the Transfer of Credits from Other Institutions. The College of Business and Management normally accepts transfer credits from regionally accredited four year institutions Junior and senior level business courses are accepted from colleges accredited by the American Assembly of Collegiate Schools of Business (AACSB) Junior and senior level business courses from other than AACSB accredited schools are evaluated on a course-by-course basis to determine transferability

Honor Societies

Beta Alpha Psi. National scholastic and professional honorary fraternity in accounting Members are elected on the basis of excellence in scholarship and professional service from junior and senior students majoring in accounting in the College of Business and Management

Beta Gamma Sigma. National scholastic honorary in business administration To be eligible students must rank in the upper five percent of their junior class or the upper ten percent of their senior class in the College of Business and Management Students are eligible the semester after they have earned 45 credits on the College Park Campus, and have earned a total of 75 credits

FMA Honor Society. National scholastic honorary sponsored by the Financial Management Association. To be eligible, students must be finance majors with a cumulative grade point average of 3.5 for a minimum of 90 credits.

Omega Rho. National scholastic honorary in operations research, management, and related areas. Members are elected on the basis of excellence in scholarship from junior and senior students majoring in appropriate quantitative areas.

Pi Sigma Phi. National scholastic honorary sponsored by the Propeller Club of the United States Membership is elected from outstanding senior members of The University of Maryland chapter of the Propeller Club majoring in transportation in the College of Business and Management.

Student Awards. Dean's List; Delta Sigma Pi Scholarship Key, Distinguished Accounting Student Awards; and Wall Street Journal Student Achievement Award.

Scholarships. Alcoa Foundation Traffic Scholarship; Delta Nu Alpha Cheasapeake Chapter No 23 Scholarship, Delta Nu Alpha Rappahannock, VA Chapter No. 288 Scholarship; Delta Nu Alpha Washington, D.C. Chapter No. 84 Scholarship; Eastern Shipper—Motor Carrier Council Scholarship; William F. Holin Scholarship; National Defense Transportation Association Scholarship, Washington, D.C. Chapter; Propeller Club Scholarship; Warren Reed Scholarship (accounting), Jack B. Sacks Foundation Scholarship (marketing); and Charles A. Taff Scholarship (transportation).

Student Professional Organizations. American Marketing Association; American Society for Personnel Administration (personnel); Beta Alpha Psi (accounting); Dean's Undergraduate Advisory Council; Delta Nu Alpha (transportation); Delta Sigma Pi (business students); Finance, Banking and Investments Society (finance); The Maryland University Minority Business Association; National Association of Accountants, National Defense Transportation Association (transportation); Phi Chi Theta (business students); Society for the Advancement of Management (all business majors), and Propeller Club of America (transportation).

Summary of Bachelor of Science Degree Requirements (all curricula)

Freshman–Sophomore Core Requirements (Prebusiness Requirements)

MATH 110 or 115, 111, and 220 or (140*and 141*)**	9 (8)
BMGT 220 and 221	6
BMGT 230 (231*)	3
ECON 201 and 203	6
SPCH 100 or 107	3
Total	27 (26)

* Required for management science-statistics curricula.

** Students ready for calculus may take MATH 221 in lieu of MATH 110 and 111.

Junior–Senior Core Requirements

BMGT 340, Business Finance (Prerequisite BMGT 221 and 230)	3
BMGT 350, Marketing Principles and Organization (Prerequisite ECON 203)	3
BMGT 364, Management and Organizational Theory (junior standing recommended)	3
BMGT 380, Business Law (junior standing recommended)	3
BMGT 495 or 495A, Business Policies (open *ONLY* to Seniors)	3
Economics (see below)	6
Total	21

Economics Requirements

Finance Curriculum: ECON 430 or ECON 431. Plus one course from ECON 401, 402 (especially recommended), 403, 440, or 450

General Business Curriculum: One course from ECON 401, 403, 430 or 440 Plus one course from an approved list of ECON, GEOG, PSYC, or SOCY courses. The approved list is available in the Undergraduate Studies Office, College of Business and Management.

All other curricula One course from ECON 401, 403, 430, or 440 Plus one of the following courses ECON 311, 316, 317, 361, 370, 374, 375, 380, or any 400 level ECON course *except* 421, 422, or 425.

Junior–Senior Major Curriculum Concentration

See specific curriculum below (accounting and decision and information sciences majors take 24 semester hrs.)	18 (24)
Total	18 (24)

University Studies Program (USPs)

Fundamental Studies Freshman Composition (ENGL 101, 171)*	3
Upper Level Composition (ENGL 391, 393)**	3
Distributive Studies 4 hrs. Area B (Lab Sci.), 6 hrs. Areas A & C***	16
Advanced Studies.	
Development of Knowledge *and* Analysis of Human Problems: from two different academic departments	6
Total	28

* Students exempt from ENGL 101 may take a 3-credit elective of any level in its place.

** Students exempt from ENGL 391/393 must take a 3-credit upper level elective in its place

*** Students with an approved 3-credit lab science course or a 4-credit Area A USP course may change the USP total (above) and the elective total (below) accordingly

Electives

BMGT 110 or other non-required upper level BMGT course for total of 45 hours in business (accounting and decision and information sciences majors may take a non-BMGT course)	3
The remaining electives must bring the degree total to 120 semester hours. The student must have sufficient upper level electives to bring the total UL courses (300 and 400 level) to 57 semester hours	?
Grand Total	120

A Typical Program for Prebusiness Freshman and Sophomore Years

	Semester Credit Hours
Freshman Year	
USPs and/or electives	9 (8)
English 101 or equivalent	3
MATH 110 or 115, 220, or (140*)	3 (4)
First semester total	15
USPs and/or electives	9 (8)
SPCH 100 or 107	3
MATH 111, 221, or (141*)	3 (4)
Second semester total	15
Sophomore Year	
USPs and/or electives**	6
BMGT 220	3
ECON 201	3
MATH 220**	3
Third semester total	15
USPs and/or electives	6
ECON 203	3
BMGT 221	3
BMGT 230 (or 231*)	3
Fourth semester total	15

* Required for management science-statistics curricula.

** Management science-statistics majors should replace MATH 220 with 3 additional hours of USPs/electives (total of 9).

Curricula

Accounting. Accounting, in a limited sense, is the analysis, classification and recording of financial events and the reporting of the results of such events for an organization. In a broader sense, accounting consists of all financial systems for planning, controlling and appraising performance of an organization. Accounting includes among its many facets financial planning, budgeting, accounting systems, financial management controls, financial analysis of performance, financial reporting, internal and external auditing, and taxation.

The accounting curriculum provides an educational foundation for careers in accounting and other management areas whether in private business organizations, government and nonprofit agencies, or public accounting firms.

Course requirements for the junior-senior curriculum concentration in Accounting are as follows

	Semester Credit Hours
BMGT 301—Introduction to Data Processing	3
BMGT 310, 311—Intermediate Accounting I and II	6
BMGT 321—Cost Accounting	3
BMGT 323—Income Tax Accounting	3
Three of the following courses:	
BMGT 326—Accounting Systems	
BMGT 410—Fund Accounting	
BMGT 417—Advanced Tax Accounting	
BMGT 420, 421—Undergraduate Accounting Seminar	
BMGT 422—Auditing Theory and Practice	
BMGT 424—Advanced Accounting	
BMGT 426—Advanced Cost Accounting	
BMGT 427—Advanced Auditing Theory and Practice	9
Total	24

The educational requirement of the Maryland State Board of Accountancy for certification is a baccalaureate or higher degree with a major in accounting, or with a non-accounting degree supplemented by coursework the Board determines to be substantially the equivalent of an accounting major.

Major in accounting shall be considered generally as constituting a minimum of (1) 30 semester hours in accounting which shall include (but shall not be limited to) courses in financial accounting, auditing, cost accounting and federal income tax, (2) 6 semester hours in commercial law.

A student planning to take the CPA examination for certification and licensing in a state other than Maryland should determine the educational requirements for that state and arrange his or her program accordingly.

Finance. The finance curriculum is designed to familiarize the student with the institutions, theory and practice involved in the allocation of financial resources within the private sector, especially the firm. It is also designed to incorporate foundation study in such related disciplines as economics and the quantitative areas.

The finance curriculum provides an educational foundation for careers involving financial analysis and management, investment analysis and portfolio management, investment banking, insurance and risk management, banking, and international finance. It also provides a foundation for graduate study in business administration, quantitative areas, economics, and law.

Course requirements for the junior-senior curriculum concentration in Finance are as follows:

	Semester Credit Hours
BMGT 301—Introduction to Data Processing	3
BMGT 343—Investments	3
One of the following courses:	
BMGT 332—Operations Research for Management Decisions	
BMGT 434—Introduction to Optimization Theory	3
Two of the following courses:	
BMGT 440—Financial Management	
BMGT 445—Commercial Bank Management	
BMGT 443—Security Analysis and Valuation	
OR	
BMGT 444—Futures Contracts and Options	6*
One of the following courses (check prerequisites):	
BMGT 302—Information Systems Implementation Techniques	
BMGT 430—Linear Statistical Models in Business	
BMGT 431—Design of Statistical Experiments in Business	
BMGT 433—Statistical Decision Theory in Business	
BMGT 435—Introduction to Applied Probability Models	
MATH xxx—three semester hours of advanced mathematics beyond the College requirement	3
Total	18

* Both BMGT 443 and 444 *cannot* be taken to complete these 6 hours

General Curriculum in Business and Management. The general curriculum is designed for those who desire a broader course of study in business and management than offered in the other College curricula. The general curriculum is appropriate, for example, for those who plan to enter small business management or entrepreneurship where general knowledge of the various fields of study may be preferred to a more specialized curriculum concentration.

Course requirements for the junior-senior curriculum concentration in general business and management are as follows

	Semester Credit Hours
Accounting Finance	
One of the following courses:	
BMGT 321—Cost Accounting	
OR	
BMGT 440—Financial Management	3

Management Science/Statistics

One of the following courses:
BMGT 332—Operations Research for Management Decisions
OR
BMGT 385—Production Management
OR
BMGT 431—Design of Statistical Experiments in Business
OR
BMGT 433—Statistical Decision Theory in Business 3

Marketing

One of the following courses:
BMGT 353—Retail Management
OR
Higher numbered marketing course (check prerequisites) 3

Personnel/Labor Relations

One of the following courses:
BMGT 360—Personnel Management
OR
BMGT 362—Labor Relations 3

Public Policy

One of the following courses:
BMGT 481—Public Utilities
OR
BMGT 482—Business and Government 3

Transportation/Physical Distribution

One of the following courses:
BMGT 370—Principles of Transportation
OR
BMGT 372—Traffic and Physical Distribution Management 3

Total 18

Management Science-Statistics. In the management science-statistics curriculum, the student has the option of concentrating primarily in statistics, decision and information sciences, or in management science. The three options are described below.

Statistics Option. Statistics consists of a body of methods for utilizing probability theory in decision-making processes. Important statistical activities ancillary to the decision-making process are the systematization of quantitative data and the measurement of variability. Some specialized areas within the field of statistics are: sample surveys, forecasting, quality control, design of experiment, Bayesian decision processes, actuarial statistics, and data processing. Statistical methods—for example, sample survey techniques—are widely used in accounting, marketing, industrial management, and government applications. An aptitude for applied mathematics and a desire to understand and apply scientific methods to significant problems are important prerequisites for the statistician.

Students planning to major in statistics must take MATH 140–141.

Course requirements for the junior-senior curriculum concentration in the statistics option are as follows:

	Semester Credit Hours
BMGT 430—Linear Statistical Models in Business	3
BMGT 432—Sample Survey Design for Business and Economics	3
BMGT 434—Introduction to Optimization Theory	3
BMGT 438—Topics in Statistical Analysis for Business and Management	3
Two of the following courses:	
BMGT 301—Introduction to Data Processing	
BMGT 385—Production Management	
BMGT 433—Statistical Decision Theory in Business	
BMGT 435—Introduction to Applied Probability Models	
BMGT 436—Applications of Mathematical Programming in Management Science	
BMGT 450—Marketing Research Methods	
STAT 400—Probability and Statistics I	6
Total	18

Decision and Information Sciences Option. Computer based information systems are an integral part of nearly all businesses, large and small. The decision and information sciences option provides the data processing skills, the managerial and organizational skills, and the analysis skills required to design and manage business information processing systems. The program gives the student a firm basis in the business functional areas: marketing, finance, production, and accounting. In addition it provides an in-depth knowledge in information processing technology, information processing implementation techniques, and management science and statistics. These skills furnish the student with the expertise to analyze business problems both qualitatively and quantitatively, to propose computer based solutions, and to implement those solutions. There are many diverse employment opportunities available to graduates of this program. The typical job areas include application programmer/analyst, systems analyst, and computer system marketing analyst. Such positions are available in both large and small corporations, management consulting firms, and government agencies.

Students planning to major in this field must complete MATH 140 and 141 prior to junior standing. Students considering graduate work in this field should complete MATH 240 or 400 as early as possible in their career. It is recommended that for the upper level English composition requirement, students choose ENGL 393—Technical Writing.

Course requirements for the junior-senior curriculum concentration in the decision and information sciences option are as follows:

	Semester Credit Hours
BMGT 301—Introduction to Data Processing	3
BMGT 302—Information Systems Implementation Techniques	3
BMGT 402—Database and Data Communication Systems	3
BMGT 403—Systems Analysis	3
BMGT 404—Seminar in Decision Support Systems	3
BMGT 430—Linear Statistical Models in Business	3
BMGT 434—Introduction to Optimization Theory	3
BMGT 435—Introduction to Applied Probability Models	3
Total	24

Management Science Option. Management science (operations research) is the application of scientific methods to decision problems, especially those involving the control of organized man-machine systems, to provide solutions which best serve the goals and objectives of the organization as a whole. Practitioners in this field are employed in industry and business, and federal, state and local governments.

Students planning to major in this field must complete MATH 140–141 prior to junior standing. Students considering graduate work in this field should complete MATH 240–241 as early as possible in their career.

Course requirements for the junior-senior curriculum concentration in the management science option are as follows:

	Semester Credit Hours
BMGT 430—Linear Statistical Models in Business	3
BMGT 434—Introduction to Optimization Theory	3
BMGT 435—Introduction to Applied Probability Models	3
BMGT 436—Applications of Mathematical Programming in Management Science	3
Two of the following courses (check prerequisites):	
BMGT 385—Production Management	
BMGT 432—Sample Survey Design for Business and Economics	
BMGT 433—Statistical Decision Theory in Business	
BMGT 438—Topics in Statistical Analysis for Business and Management	
BMGT 485—Advanced Production Management	
BMGT 301—Introduction to Data Processing	
BMGT 402—Database and Data Communication Systems	
BMGT 403—System Analysis	
STAT 400—Applied Probability and Statistics I	6
Total	18

Marketing. Marketing, the study of exchange activities, involves the functions performed in getting goods and services from producers to users. Career opportunities exist in manufacturing, wholesaling, retailing, service organizations, government, and non-profit organizations and include sales administration, marketing research, advertising, merchandising, physical distribution, and product management.

Students preparing for work in marketing research are advised to elect additional courses in management science and statistics.

Course requirements for the junior-senior curriculum concentration in marketing are as follows:

	Semester Credit Hours
BMGT 354—Promotion Management	3
BMGT 450—Marketing Research Methods	3
BMGT 451—Consumer Analysis	3
BMGT 457—Marketing Policies and Strategies	3
Two of the following courses (check prerequisites):	
BMGT 332—Operations Research for Management Decisions	
BMGT 353—Retail Management	
BMGT 372—Traffic and Physical Distribution Management	
BMGT 431—Design of Statistical Experiments in Business	
BMGT 453—Industrial Marketing	
BMGT 454—International Marketing	
BMGT 455—Sales Management	
BMGT 456—Advertising	6
Total	18

Personnel and Labor Relations. Personnel administration has to do with the direction of human effort It is concerned with securing, maintaining and utilizing an effective working force People professionally trained in personnel administration find career opportunities in business, in government, in educational institutions, and in charitable and other organizations

Course requirements for the junior-senior curriculum in personnel and labor relations are as follows.

	Semester Credit Hours
BMGT 360—Personnel Management	3
BMGT 362—Labor Relations	3
BMGT 460—Personnel Management—Analysis and Problems	3
BMGT 462—Labor Legislation	3
BMGT 464—Organizational Behavior	3
One of the following courses (check prerequisites):	
BMGT 385—Production Management	
BMGT 467—Undergraduate Seminar in Personnel Management	
GVPT 411—Public Personnel Administration	
JOUR 330—Public Relations	
PSYC 361—Survey of Industrial and Organizational Psychology	
PSYC 451—Principles of Psychological Testing	
PSYC 452—Psychology of Individual Differences	
SOCY 447—Small Group Analysis	
SOCY 462—Industrial Sociology	3
Total	18

Production Management. This curriculum is designed to acquaint the student with the problems of organization and control in the field of production management Theory and practice with reference to organization, policies, methods, processes and techniques are surveyed, analyzed and evaluated.

Course requirements for the junior-senior curriculum concentration in production management are as follows:

	Semester Credit Hours
BMGT 321—Cost Accounting	3
BMGT 360—Personnel Management	3
BMGT 385—Production Management	3
BMGT 485—Advanced Production Management	3
Two of the following courses:	
BMGT 433—Statistical Decision Theory in Business	
BMGT 453—Industrial Marketing	
BMGT 362—Labor Relations	
BMGT 332—Operations Research for Management Decisions	
BMGT 372—Traffic and Physical Distribution Management	6
Total	18

Transportation. Transportation involves the movement of persons and goods in the satisfaction of human needs. The curriculum in transportation includes an analysis of the services and management problems, such as pricing, financing, and organization, of the five modes of transport—air, motor, pipelines, railroads, and water—and covers the scope and regulation of transportation in our economy. The effective management of transportation involves a study of the components of physical distribution and the interaction of procurement, the level and control of inventories, warehousing, material handling, transportation, and data processing The curriculum in transportation is designed to prepare students to assume responsible positions with carriers, governmental agencies, and in traffic and physical distribution management in industry

Course requirements for the junior-senior curriculum concentration in transportation are as follows:

	Semester Credit Hours
BMGT 332—Operations Research for Management Decisions	3
BMGT 370—Principles of Transportation	3
BMGT 372—Traffic and Physical Distribution Management	3
BMGT 473—Advanced Transportation Problems	3
One of the following courses:	
BMGT 470—Land Transportation Systems	
BMGT 471—Air and Water Transportation Systems	3
One of the following courses:	
BMGT 385—Production Management	
BMGT 301—Introduction to Data Processing	
BMGT 470 or BMGT 471 (depending on choice above)	
BMGT 474—Urban Transportation and Development	
BMGT 475—Advanced Logistics Management	
BMGT 481—Public Utilities	
BMGT 482—Business and Government	3
Total	18

Business and Law, Combined Program. The College of Business and Management offers a combined business-law curriculum in which the student completes three years in the chosen curriculum concentration in the College and a fourth year of work at The University of Maryland School of Law Admission to the law school is contingent upon meeting the applicable standards of that school. Individual students are responsible for securing from the law school its current admission requirements The student must complete all the courses required of students in the College, except BMGT 380 and BMGT 495 This means the student must complete all the pre-business courses, both upper level ECON courses, BMGT 340, 350, and 364, all lower level and upper level USP requirements; the 18–24 hours in the student's specific business major, and enough additional electives to equal a minimum of 90 semester hours, 30 of which must be numbered 300 or above No business law course can be included in the 90 hours The last year of college work before entering the law school must be completed in residence at College Park

The Bachelor of Science degree is conferred by the College upon students who complete the first year in the law school with an average grade of C or better.

Insurance and Real Estate. Students interested in insurance or real estate may wish to concentrate in finance or general business and management and plan with their advisors a group of electives to meet their specialized needs

College courses occasionally offered in insurance are
BMGT 345—Property and Liability Insurance
AND
BMGT 346—Risk Management
AND
BMGT 347—Life Insurance

College courses occasionally offered in real estate are
BMGT 393—Real Estate Principles
AND
BMGT 490—Urban Land Management

Institutional Management. Students interested in hotel-motel management or hospital administration may wish to concentrate in general business and management, finance, or personnel and labor relations and should plan with their advisors a group of electives to meet their specialized needs

International Business. Students interested in international business may wish to concentrate in marketing, finance, transportation, or general business and management and should plan with their advisors a group of electives to meet their specialized needs.

Course Code Prefix—BMGT

Behavioral and Social Sciences Departments, Programs and Curricula

Afro-American Studies Program

Professor and Acting Director: Billingsley*(Sociology)
Professor: M Williams*(Anthropology)
Associate Professor: Landry*(Sociology)
Assistant Professors: Brooks, Harley
Lecturers: Gittens, Smead, O Williams

* *Joint appointment with unit indicated.*

The Afro-American Studies Program offers a Bachelor of Arts degree to students who declare a major in Afro-American studies and who fulfill the academic requirements of this degree program Afro-American studies offers two areas of specialization: the general concentration and the public policy and planning concentration

Students who want to take a major in another department, and wish a concentration outside their major can take 21 credit hours of coursework with an emphasis on black life and experience and receive a Certificate in Afro-American Studies (see Undergraduate Certificates).

Undergraduates in good standing may enroll in the program by contacting the Director of Afro-American Studies in Room 2169, LeFrak Hall, or at (301) 454–6676 Students pursuing a major or certificate must meet the University Studies Program and division requirements.

Requirements for a Major in the General Concentration

	Semester Credit Hours
Basic Core Courses: AASP 100, 200, 202, 300	12
AASP Upper Division Electives (300–400 numbers)	18
Seminars—AASP 401 and 397	6
Total	36

Requirements for a Major in Public Policy and Planning

	Semester Credit Hours
Basic Core Courses AASP 100, 202, 300, 428J	12
Elementary Statistics (STAT 100 or SOCY 201)	3
Elementary Economics (ECON 201 or 205)	3
Electives (300–400 level) in Policy Area	9
Internship	3
Seminars—AASP 428K and 397	6
Total	36

Each course counted for the above requirements must be passed with a grade of C or better. Related and supporting courses taken in other departments must be approved by a faculty advisor of the student's program plan.

Course Code Prefix—AASP

Anthropology

Associate Professor and Chairman: Chambers
Professors: Agar, Gonzalez, Kerley, A. Williams, M. Williams*(Afro-American Studies)
Associate Professor: Leone
Assistant Professors: Dent, Stuart
Lecturers: Cassidy (p.t.), Eidson (p.t.), Kedar (p.t.)

* *Joint appointment with unit indicated.*

Anthropology has been defined as "the study of humanity" because it is the only discipline which tries to understand humans as a whole—as an animal, as a social being, as a literate being— from the very beginning of time and all over the world. Anthropologists try to explain differences among humans—differences in their physical characteristics as well as their customs, behavior, and attitudes. Since children learn their culture from the older generation, who in turn learned it from the preceding generation, culture is a product of the past. Anthropologists study the way human culture has grown and changed through time, and the way the species has spread over the earth. This is not the history of kings and great women or men or of wars and treaties, it is the history, including the present, and science of human knowledge and behavior.

The cross-cultural experience gives us not only specific knowledge of other cultures, which may be important in a variety of public health, business, agricultural and diplomatic endeavors, but also an appreciation of how strongly people feel about the cultural patterns with which they grew up. The four subfields of anthropology (cultural anthropology, archaeology, physical anthropology and linguistics) have proven valuable in understanding not only foreign cultures, but also segments of our own society, as in urban ghettos or in institutions such as hospitals and schools. They all deal with people and culture, and thus contribute to the development of the holistic view which, more than any other element, characterizes anthropology as a discipline.

It is becoming increasingly clear that anthropology has been a definite asset in finding jobs in a variety of fields ranging from business to the fine arts. Whether one goes on to a Masters or a Ph.D., striving to advance the frontiers of knowledge concerning our species and the cultural process, or combines the anthropology B.A. with other specific knowledge and goes out as a city planner, development consultant, program evaluator, or whatever, is up to the individual. Anthropology at UMCP offers a solid and rigorous background for a variety of career options.

The Anthropology Department offers beginning and advanced coursework in the four principal subdivisions of the discipline: physical anthropology, linguistics, archaeology and cultural anthropology. Within each area, the Department offers some degree of specialization and provides a variety of opportunities within the curriculum. Laboratory courses are offered in physical anthropology and archaeology; field schools are offered in archaeology and ethnography. Instruction is available in both Old World and New World archaeology and ethnology, and lab courses include human evolution, human population biology, forensic anthropology, osteology, and archaeological analysis. The interrelationship of all branches of anthropology is emphasized. Courses in these subdivisions may be used to fulfill the minor or "supporting courses" requirement in some programs leading to the B.A. degree.

The Anthropology Department has a total of four laboratories located in Woods Hall, which are divided into teaching labs and research labs. At present, there are two physical anthropology labs: one osteological research lab, and one "wet" lab for teaching and research in serology, histology, and anatomy. These laboratories contain radiographic, histolic, and electrophonetic equipment, and the osteological lab is centered around an extensive research collection. The Department's two archaeology labs, containing materials collected from field schools of the past several years, serve as both teaching and research labs.

Anthropology Major. A student who declares a major in anthropology will be awarded a Bachelor of Arts degree upon fulfilment of the requirements of the degree program. The student must complete at least 30 hours of courses labeled ANTH with a grade of C or better in each course. The courses are distributed as follows:

a. Eighteen (18) hours of required courses which must include ANTH 101, 102, 397, 401, 441 or 451 and 371 or 461 or 361.
b. Twelve (12) hours of elective courses in anthropology of which nine (9) hours must be at the 300 level or above.
c. Eighteen (18) hours of supporting courses (courses outside of anthropology offerings in fields which are complementary to the major's specific anthropological interest). Supporting courses are to be chosen by the student and approved by a faculty advisor.

In addition to the above requirements anthropology majors must meet those of the Division of Behavioral and Social Sciences specifying general courses, grade point average, course load and the forty (40) credit hours of University Studies Program approved courses required of every degree-seeking student of the University.

The Advising System. The Anthropology Department allows the student to select his or her faculty advisor to fit particular interests and needs. All anthropology faculty members are advisors (and should be contacted individually) who help plan each student's program. All majors are expected to seek out a faculty advisor and consult with him/her on a regular basis. For additional information, students should contact the Undergraduate Studies Coordinator, Dr. Richard Dent, Room 1106, Woods Hall, telephone 454–5354.

The Honors Program. The Anthropology Department also offers an Honors Program which provides the student an opportunity to pursue in-depth study of her or his interests. Acceptance is contingent upon a 3.5 GPA in anthropology courses and a 3.0 overall average. Members of this program are encouraged to take as many departmental honors courses as possible. The citation is awarded upon completion and review of a thesis to be done within the field of anthropology. Details and applications are available in the Anthropology Office, or contact your advisor for further information.

ANTH 101 (or equivalent), or permission of instructor is prerequisite for all upper division archeology or physical anthropology courses. ANTH 102 (or equivalent), or permission of instructor is prerequisite for all upper division cultural anthropology and linguistics courses.

Anthropology Student Association. An anthropology student association meets regularly to plan student events and to help coordinate various student and faculty activities. Meeting times are posted outside Room 0133, Woods Hall.

Course Code Prefix—ANTH

Business and Economic Research

Professor and Director: Cumberland
Professors: Harris, Oates* (Economics), Mueller* (Economics)
Associate Professor: Cropper* (Economics)
Visiting Assistant Professor: Hovis

* *Joint appointment with unit indicated.*

The functions of the Bureau of Business and Economic Research are research, education and public service.

The research activities of the Bureau are primarily focused on basic research and applied research in the fields of regional, urban, public finance and environmental studies. Although the bureau's long-run research program is carried out largely by its own staff, faculty members from other departments also participate. The Bureau also undertakes cooperative research programs with the sponsorship of federal and state governmental agencies, research foundations and other groups.

The educational functions of the Bureau are achieved through active participation by advanced graduate and undergraduate students in the Bureau's research program. This direct involvement of students in the research process under faculty supervision assists students in their degree programs and provides research skills that equip students for responsible posts in business, government and higher education.

The Bureau observes its service responsibilities to governments, business, and private groups primarily through the publication and distribution of its research findings. In addition, the Bureau staff welcomes the opportunity to be of service to governmental and civic groups by consulting with them on problems, especially in the fields of regional and urban economic development and forecasting, state and local public finance, and environmental management.

Criminal Justice and Criminology

Director and Professor: Wellford
Professor Emeritus: Lejins* (Sociology)

Criminal Justice Curriculum
Professor: Sherman
Associate Professor Ingraham
Assistant Professors Paternoster, Uchida
Part-time Lecturers: Mauriello, Wolman

Criminology Program
Professor: Lottin
Associate Professor: Maida
Assistant Professors: Smith, Young

* *Joint appointment with unit indicated.*

The purpose of the Institute is to provide an organization and administrative basis for the interests and activities of the University, its faculty and students in

the areas usually designated as criminal justice, criminology and corrections. The Institute is to promote study and teaching concerning the problems of crime and delinquency by offering and coordinating academic programs in the area of criminal justice, criminology and corrections, managing research in these areas, and conducting demonstration projects.

The Institute comprises as its component parts:

1. The Criminology Program, leading to a B.A. degree.
2. The Criminal Justice Curriculum, leading to a B.A. degree.
3. Graduate Program offering M.A. and Ph.D. degrees in Criminal Justice and Criminology.

The major in criminology comprises 30 hours of coursework in Criminology and Criminal Justice. Eighteen hours in social or behavioral science disciplines are required as a supporting sequence. In these supporting courses a social or behavioral science statistics and a social or behavioral science methods course are required. Psychology 331 or 431 is also required. In addition, two psychology elective courses and a general social psychology course are required. Regarding the specific courses to be taken, the student is required to consult with an advisor. No grade lower than C may be used toward the major or the supporting courses.

Course Code Prefix—CRIM

Major	*Semester Credit Hours*
CRIM 220	3
CRIM 450	3
CRIM 451	3
CRIM 452	3
CRIM 453	3
CRIM 454	3
CRIM/CJUS Elective	6
CJUS 100	3
CJUS 230	3
Total	30

Supporting	*Semester Credit Hours*
PSYC 331 or 431	3
Social Psych—such as PSYC 221, SOCY 230, SOCY 430 or SOCY 447	3
PSYC electives	6
Soc. Sci. statistics	3
CRIM/CJUS 300	3
	18
Total for Major and Supporting	48

The major in criminal justice comprises 30 hours of course work in criminal justice and criminology, the latter being offered as courses in the Criminology Program, divided as follows: 18, but not more than 24, hours in criminal justice; 6, but not more than 12, hours in criminology. In addition to major requirements, a student must take 6 hours in methodology and statistics, and a supporting sequence of courses totalling 18 hours must be taken in government and politics, psychology, sociology, business management or counseling. No grade lower than C may be used toward the major, or to satisfy the statistics-methodology requirement. An average of C is required in the supporting sequence courses.

Course Code Prefix—CJUS

Major (Required)	*Semester Credit Hours*
CJUS 100	3
CJUS 230	3
CJUS 234	3
CJUS 340	3
CRIM 220	3
CRIM 450	3

(Select 4 courses from)	*Semester Credit Hours*
CJUS 220	3
CJUS 320	3
CJUS 330	3
CJUS 350	3
CJUS 360	3
CJUS 398	3
CJUS 399	3
CJUS 444	3
CJUS 462	3
CRIM 432	3
CRIM 451	3
CRIM 453	3
CRIM 454	3
CRIM 455	3
Total	30

Supporting	*Semester Credit Hours*
Social Science Statistics	3
CRIM/CJUS 300	3
Supporting sequence: 18 credit hours of specific recommended courses in GVPT, SOCY, BMGT and PSYC (see recommended list in Institute Office)	18
	24
Total for Major and Supporting	54

Criminal Justice/Criminology Honors Program

The Honors Program provides superior students the opportunity for advanced study in both a seminar format and independent study under the direction of the faculty. The Honors Program is a three-semester (9 credit hour) sequence which a student begins in the spring semester, three or four semesters prior to graduation. CRIM/CJUS 388H, the first course in the sequence, is offered only during the spring semester. The second and third courses in the sequence consist of a year-long research project (6 credits, 3 each semester) or an honors thesis (one semester, 3 credits) followed by a graduate seminar in the Institute (one semester, 3 credits). Honors students may count their Honors courses toward satisfaction of their curriculum requirements: if they are criminal justice majors, they may count their Honors courses toward satisfaction of the basic 30-hour requirement, if they are criminology majors, they may count their Honors courses in place of the psychology electives and social psychology supporting course requirements. Requirements for admission to the Honors Program include a cumulative grade-point-average of at least 3.25, no grade lower than B for any criminology or criminal justice course, and evidence of satisfactory writing ability.

Division Computer Laboratory

Director: Bennett

The Division Computer Laboratory provides support services to faculty, staff and students in the use of computers for learning, teaching and research. It provides microcomputers and terminals in classrooms and offices, minicomputers for specialized research and instruction, short courses on computer use, lecturers for special meetings of regular classes, and a general programming-consulting service. The Laboratory also maintains a data archiving service, regularly-updated databases of social and economic data, a small library, and a computer graphics laboratory.

Economics

Professor and Chairman: Hulten

Professors: Aaron, Adams, Almon, Bergmann, Betancourt, Brechling, Clague, Cumberland, Dillard (Emeritus), Harris, Kelejian, McGuire, Mueller, Oates, Olson, Schultze, Straszheim, Ulmer (Emeritus), Wonnacott

Associate Professors: Bennett, Coughlin, Cropper, Knight, Meyer, Murrell, Panagariya, Weinstein

Assistant Professors: Kessides, Kiguel, Kole, Prucha, Succar, Wallis

The undergraduate economics program is designed to give students an understanding of the American economic system and our country's economic relations with the rest of the world, and the ability to analyze the economic forces which determine the production of goods and services, the level of prices, the distribution of income, and other economic factors which influence the quality of life. Such study includes an analysis of current economic problems and the merits of alternative public policies which influence social outcomes. The program for majors prepares students for employment after college as well as for work toward advanced degrees.

Requirements for the Economics Major. In addition to the University Studies Program Requirements, the requirements for economics majors are as follows.

(1) Economic Courses (30 hours)

Economics majors must earn 30 credit hours in economics with an average grade in all economics courses of not less than C. Courses required of all majors are: ECON 201, ECON 203, ECON 310, ECON 401, ECON 403, and ECON 421.

In lieu of ECON 401, the student may take ECON 405; in lieu of ECON 403, the student may take ECON 406. In lieu of ECON 421, the student may take one of the following statistics courses: BMGT 230, BMGT 231, or STAT 400. A student who takes ECON 205 (Fundamentals of Economics) before deciding to major in economics may continue with ECON 203, without being required to take ECON 201.

The remainder of the 30 hours may be chosen from among any other upper division economics courses. Students who take ECON 421 may not also receive credit to BMGT 230 or BMGT 231. The Department urges students to take more than the minimum of 30 hours, especially if the student is going to graduate school. The required 30 hours of economics courses may not be taken Pass/Fail.

(2) Mathematics Supporting Courses (6 hours)

Six credit hours of mathematics are required including one semester of calculus. No specific courses are required, but the combination of MATH 110 (Introduction to Mathematics) and MATH 220 (Elementary Calculus) is the minimum. Students completing MATH 220 or its equivalent have satisfied the

mathematics requirements. Students planning to do graduate study in economics are strongly urged to take more than the minimum six-hour mathematics requirement. Mathematics supporting courses may not be taken Pass/Fail.

(3) Additional Supporting Courses (18 hours)

Economics majors must earn credit for eighteen hours of upper division work in addition to the 30 hours of economics courses listed above. For purposes of this requirement, any of the following may count as an "upper division" course: any course numbered 300 or above; any second year course in mathematics beyond the six hours required of all economics majors; and any course in a department for which the prerequisites are the equivalent of one year of college-level work in that department. In particular, second year college courses in foreign languages and sciences may be counted as "upper division." Students may include as part of their 18 hours of supporting courses, any upper division economics courses which are not counted among their 30 hours of economics courses. Supporting courses may not be taken Pass/Fail.

Study Sequences and Plans of Study. While the regulations allow students very considerable latitude in their choice of courses, the Department urges that the student take ECON 201, 203 and begin in the required mathematics courses as soon as possible. Upon completion of ECON 203, the student should promptly take ECON 401, 403, or both, in the following semester, since these are intermediate theory courses of general applicability in the later coursework. Majors should take ECON 421 (or equivalent) after calculus is completed. ECON 310 may be taken any time after completing ECON 203.

Courses in applied areas at the 300 and 400 level may begin at any point after ECON 203, though there is some benefit to completing the intermediate theory courses first. While the Department does not require any particular set of electives, students can benefit from giving some attention to defining sub-specialties within economics of interest or of importance for subsequent career plans, and completing the several relevant courses to that sub-specialty. Courses making extensive use of the computer include ECON 398D (Computer Methods in Economics) and ECON 402 (Business Cycles).

Students seeking advising should consult the Advising Office, 3115O Tydings Hall (454–5443).

Those students planning to pursue graduate study in economics must begin to prepare themselves analytically for graduate work by focusing on theory, statistics, and mathematics in their undergraduate curriculum. This should include ECON 422(Quantitative Methods) and ECON 425 (Mathematical Economics) in their program. Additional mathematics, including more calculus and linear algebra, is recommended.

Economics Honors Program. The Honors Program provides economics majors with the opportunity for advanced study in a seminar format, with faculty supervision of seminar papers and an honors thesis. It is designed for students intending to attend graduate school or those who seek an in-depth study of economic theory and its application to economic problems.

The Honors Program is a twelve-hour sequence, culminating in the completion of a senior thesis. Students must complete ECON 396 (Honors Workshop) and ECON 397 (Honors Thesis) in their senior year, as well as two of the following four courses: ECON 405, 406, 422, and 425. Students must complete these twelve hours with a G.P.A. of 3.5. ECON 396 is offered only in the fall term. To be eligible for admission, a student must have completed 15 hours of economics with a G.P.A. of 3.25.

Interested students should meet with the Director of Undergraduate Studies at the earliest possible date to review their curriculum plans and to apply for admission to the program.

Course Code Prefix—ECON

Geography

Professor and Chairman: Corey
Professors: Fonaroff, Harper
Associate Professors: Brodsky, Chaves, Christian* (Urban Studies), Cirrincione* (Secondary Education), Groves, Leatherman, Mitchell, Thompson, Wiedel
Assistant Professors: Kearney, Lai, Petzold, Sawyer
Part-time Lecturers: Broome, Frieswyk, Monte
Adjunct Professor: Morrison
Affiliated Faculty: Corsi, Pemberton
Visiting Professor: Deshler
Assistant Research Scholar: Goward

* *Joint appointment with unit indicated.*

Geography is an interdisciplinary field that offers a wide range of career options. The central question in geographical study is "where?" Geographers research locational questions of the natural environment, of social and economic systems, and of past human activity on the land. Modern geographical knowledge is useful to policy makers, as well as to program planners and managers. Students of geography must master a variety of methods and techniques that are useful in locational analysis, including computer applications and mapping, map making or cartography, air-photo interpretation and remote sensing, field observation, statistical analysis, computer applications and mapping, and mathematical modelling. In addition to methodological knowledge, students of geography also must master substantive knowledge—either in the physical/natural sciences or the behavioral/social sciences. The ability to write clearly and to synthesize information and concepts are valued highly in geographical education and practice. International interests are best pursued with complementary study emphases in foreign languages and area studies.

Increasingly geographers today use their combined methodological and substantive knowledge towards the solution of society's problems. Many graduate geographers take positions in planning, natural resources management, and policy analysis.

Geographers in the federal government work in the Departments of State, Interior, Defense, Agriculture, Housing and Urban Development, Health and Human Services, and the Central Intelligence Agency. They are on the staffs of the legislative research branch, the Library of Congress and the National Archives. At the state and local government level there is an increasing demand for geographers in planning positions. And in recent years more and more geographers also are employed in the private sector working on problems of industrial and commercial location and market analysis. Teaching at all levels from elementary school through graduate work continues to employ many geographers each year. Some find geography to be an excellent background for careers in the military, journalism, law, travel and tourism, the nonprofit sector, and general business; others find the multiple perspectives of geography an excellent base for a general education. For those interested in the future, the field has high potential for better understanding and planning for the economic transformation to an information-services economy, knowledge-intensive society. Most professional positions in geography require graduate training.

Requirements for an Undergraduate Major. Within any of the general major programs it is possible for the student to adjust his/her program to fit his/her particular individual interests. The major totals 37 semester hours. In addition to the 37 semester hours, the geography major is required to take an additional 15 semester hours of supporting coursework outside of the Department. The hours can be either in one department or in an area of concentration. An area of concentration requires that a written program of courses be reviewed and placed on file by the Department advisor. See Professor Cirrincione, 1125 LeFrak Hall, telephone 454–2244. Supporting courses generally are related to the area of specialty in geography. Pass-fail option is not applicable to major or supporting courses. A minimum grade of C in each course is required for major and supporting courses.

The required courses of the geography majors are as follows:

	Semester Credit Hours
Geography Core (GEOG 201, 202, 203, 211, 305, 310)	16
An additional techniques course (selected from 370, 372, 380)	3
A regional course	3
Elective systematic and techniques courses	15
Total	37

The Geography Core—The following six courses form the minimum essential base upon which advanced work in geography can be built:

GEOG 201—Environmental Systems in Geography	3
GEOG 202—Introductory Cultural Geography	3
GEOG 203—Introductory Economic Geography	3
GEOG 211—Environmental Systems in Geography Laboratory	1
GEOG 305—Quantitative Methods in Geography	3
GEOG 310—Research and Writing in Geography	3

The three lower division courses are to be completed prior to GEOG 310 and all other upper division courses. GEOG 201/211, 202, and 203 may be taken in any order and a student may register for more than one in any semester. GEOG 211 may be taken concurrent with, or after taking GEOG 201. GEOG 305 is prerequisite to GEOG 310. GEOG 310 is specifically designed as a preparation to upper division work and should be taken by the end of the junior year. Upon consultation with a department advisor, a reasonable load of other upper division work in geography may be taken concurrently with GEOG 310. Completion of GEOG 310 satisfies for geography majors only the upper level English composition requirement.

The techniques requirement may be fulfilled by taking one of the following: GEOG 370—Cartographic Principles, GEOG 372—Remote Sensing, GEOG 373—Computer Mapping and GEOG 380—Local Field Course.

Suggested Program of Study for Geography

Freshman and Sophomore Years	*Semester Credit Hours*
GEOG 100, 110, 120, 130, 140, 150, 160, 170 or 171 (1)—Introductions to Geography (Does not count toward geography major)	3 + 1
GEOG 201—Environmental Systems in Geography	3
GEOG 202—Introductory Cultural Geography	3
GEOG 203—Introductory Economic Geography	3
GEOG 211-Environmental Systems in Geography Laboratory	1
General University, or University Studies Program Requirements and/or electives	47
	60

Junior Year	
GEOG 305—Quantitative Methods in Geography	3
GEOG 310—Research and Writing in Geography	3
GEOG—A regional geography course	3
GEOG—Techniques (choice)	3
GEOG—Elective	3
General University, or University Studies Program Requirements and/or electives	15
	30
Senior Year	
GEOG—Courses to complete major	12
Electives	18
	30
Total	120

Introduction to Geography. The 100-level geography courses are general education courses for persons who have had no previous contact with the discipline in high school or for persons planning to take only one course in geography. They provide general overviews of the field or one of its major topics. Credit for these courses is not applied to the major.

Areas of Specialization. Although the major program is flexible and can be designed to fit any individual student's own interest, several specializations attract numbers of students. They are:

Urban Geography and Regional Development—Provides preparation for careers in planning, development, research, and teaching. Majors electing this specialty take departmental courses in urban geography, location, theory and spatial analysis, transportation, and economic geography among others, and supporting courses in urban sociology, urban economics, urban transportation, housing and design, family and community development, architecture, and the urban studies program outside the department.

Environmental Analysis, Resources Management and Physical Geography—For students with special interest in the natural environment and in its interaction with the works of man. This specialization consists of departmental courses in geomorphology, climatology, and energy, pollution and water resources, and of supporting courses in geology, soils, meteorology, civil engineering hydrology, and botany.

Computer Mapping, Cartography and Spatial Analysis—Prepares students for careers in map design, compilation and reproduction. The Department offers various courses in thematic mapping, cartographic history and theory, map evaluation, map, photo, and image interpretation, computer-assisted cartography, spatial statistics, and geographic information systems. Students concentrating in cartography are not required to take GEOG 305 and are limited to nine hours of upper level systematic geography courses. Students must complete fifteen hours in Cartography/Geographic Techniques. Supporting area courses must be taken from a list provided by the Department. All math programs should be approved by a departmental advisor.

Human and Historical Cultural Geography—Of interest to students particularly concerned with the geographic aspects of population, politics, and other social and cultural phenomena, and with historical and locational processes in cities and in colonial settlement. In addition to departmental course offerings this specialization depends on work in sociology, anthropology, government and politics, history, and economics.

For further information on any of these areas of interest the student should contact a departmental advisor.

All math programs should be approved by a departmental advisor.

Internship. The Department offers a one-semester internship program for undergraduates (GEOG 384 and 385). The goal of the program is to enhance the intellectual growth and the career opportunities of undergraduates. The internship provides the students with an opportunity to expand their understanding of the field by linking the theoretical aspects of geography acquired in the classroom to the applied aspects operating in a working situation. The internship program is open only to Geography juniors and seniors. All interns must have the following prerequisites: GEOG 201, 202, 203, 211, 305 and 310. An application form from the undergraduate Geography advisor must be submitted one semester before the internship is desired.

Honors and Geography Club. For information on the geography honors program contact the undergraduate advisor. Gamma Theta Upsilon, the geography undergraduate organization, operates a peer-advising service during registration periods.

Special Facilities. In addition to the Department's laboratories in environmental analysis and physical geography, and cartographic and remote sensing instruction, the Department jointly operates, with the Division of Behavioral and Social Sciences, a well-equipped Computer Mapping and Spatial Analysis Laboratory. This facility contains a number of Tektronix graphic workstations recently enhanced with the acquisition of two 4113B and one 4107 color raster graphics terminals, a Tektronix BASIC language programmable graphics micro-computer, and small graphic tablets. Other equipment in the laboratory includes two digitizing tables, 2 pen-plotters, and paper copy devices. The terminals connect to a PRIME 9650 mini-computer which is utilized primarily for graphics applications and instructional simulations. Other acquisitions include (1) an IBM microcomputer color-graphics workstation consisting of the new Advanced Personal Computer with plotter and printer, and (2) four other IBM micro-computer color graphics workstations equipped with a variety of hardware and software options. A comprehensive range of readily-accessible and working software for mapping and spatial analysis supports instructional, service, and research needs. The software library includes ESRI/GIS, GIMMS, USGS-CAM, SYMAP, GEOSYS, FLOW, SURFACE II, and locally-developed software for digitizing, shore-line measurement, and districting mapping. Map production services are available through a fully-equipped Cartographic Services Laboratory including four photographic darkrooms.

Geography Minor and Secondary Education Geography Specialization. Secondary Education majors with a concentration in geography are required to take 27 hours in the content field, GEOG 201, 202, 203, 211, 305 and 490, or another upper-level course reflecting interest. The remaining 12 hours of the program consists of 3 hours of regional geography and 9 hours of upper-division systematic courses. For majors in elementary education and others needing a geography course for teaching certification, GEOG 100 is the required course.

Geography minors should take at least GEOG 201, 202 and 203 in the geography core and 310 is recommended. As with the major, these courses should be taken before any others.

Course Code Prefix—GEOG

Governmental Research

Director: Eads (acting)
Faculty Research Associate: Cohen

The Bureau of Governmental Research is the research component of the School of Public Affairs. Its program is designed to fit closely with the School's teaching program. Accordingly, its research is expected to emphasize the relationship between local, state and the federal government, the interaction between government and the private economy, national security, the international contexts of domestic policy problems, as well as normative issues that arise in the public sector.

The Bureau's research is typically oriented to addressing specific public sector problems. Through the School's emphasis on intergovernmental relations, the Bureau will continue its study of state and local government problems in Maryland.

Government and Politics

Professor and Chairman: Ouester
Professors: Azar, Bobrow, Butterworth, Claude, Conway, Dawisha, Dillon (Emeritus), Glass, Harrison (Emeritus), Hathorn (Emeritus), Hsueh, McNelly, Oppenheimer, Phillips, Piper, Pirschke (Emeritus), Stone*(Urban Studies), Wilkenfeld
Associate Professors: Elkin, Glendening, Heisler, Pirages, Ranald, Reeves, Terchek, Uslaner
Assistant Professors: Alford, Edelstein (affiliate), Foreman, Kaiser, Kaminski, Lanning, Mason, McCarrick, McIntosh, Meisinger (affiliate), Soltan
Lecturer: Vietri, Weinberg

* *Joint appointment with unit indicated.*

The Department of Government and Politics offers programs designed to prepare students for government service, politics, foreign assignments, teaching, and a variety of graduate programs, law schools, and for intelligent and purposeful citizenship. Satisfactory completion of requirements leads to a B.A. degree in government and politics.

The study of politics is both an ancient discipline and a modern social science. The origin of the discipline can be traced back to the earliest times when philosophers, statesmen, and citizens studied the nature of government, justice, responsibility, and the consequences of government's action. More recently, the study of politics has also emphasized scientific observations about politics. Today, the discipline reflects a broad effort to collect data about politics and governments utilizing relatively new techniques developed by all of the social sciences.

The Department of Government and Politics combines both philosophical and scientific concerns in its overall program as well as in specific courses and emphasizes such broad areas as political development, policy analysis, social justice, political economy, conflict, and human rights. These broad conceptual areas are integral components of the formal fields in the Department. The formal fields are (1) American government and politics, (2) comparative government, (3) political theory, (4) international affairs, (5) public administration, (6) public law, and (7) public policy and political behavior.

Areas of Specialization. The program in government and politics is highly flexible, and a variety of advising programs have been developed which meet the academic and career interests of departmental majors. The tracts listed below are among the more popular ones in the department, and students can construct their own program with an advisor.

Pre-Law. Provides the student with a strong liberal arts background emphasized by law schools, includes at least one course in law, additional

courses in the political and social context of law, a pre-law skill package as well as appropriate courses outside of the department.

Public Sector Employment. Within this broad category are advising programs in general public administration leading to careers at entry level positions in federal, state, and local governments, public finance and budgeting, public policy analysis, and public personnel management. Quantitative skills are highly recommended in this area, and majors are advised to select a strong substantive minor to complement their work in public administration, American politics, and public law.

International Relations. Combines courses in the department in international relations and comparative politics along with a strong substantive minor, such as economics, business, or resource management. In addition, a strong background in a foreign language is highly recommended.

Public Interest. A broadly defined area emphasizing the American political system, organizing, campaigning, lobbying, policy analysis, and public sector management.

In addition, the department also offers strong programs in political theory, comparative human rights, environmental politics, women and politics, and urban politics.

Requirements for the Government and Politics Major. Government and Politics majors must take a minimum of 36 semester hours in government courses and may not count more than 42 hours in government toward graduation. No government course in which the grade is less than C may be counted as part of the major. No government courses in the major may be taken on a pass-fail basis.

All government majors are required to take GVPT 100, 170, 441 or 442 and such other supporting courses as specified by the department. They must take one course from three separate government fields as designated by the department.

All departmental majors shall take ECON 205 or ECON 201. In addition, the major will select courses from one of the following options: (a) methodology, (b) foreign language, (c) philosophy and history of science, or (d) pre-law. A list of courses which will satisfy each option is available in the departmental office.

All students majoring in government must fulfill the requirements of a secondary area of concentration, which involves the completion of 15 semester hours from approved departments other than GVPT. At least six of the 15 hours must be taken at the 300–400 level from a single department.

Students who major in government may apply for admission to the GVPT Honors Program. Additional information concerning the Honors Program may be obtained at the departmental offices.

The department offers students the opportunity to observe government agencies and political groups in action through a variety of internship experiences. Only nine (9) hours of GVPT credit will apply to the 36 hours needed in the major. In no case may more than 15 GVPT internship credits be counted toward the 120 credits needed to graduate.

Academic advising is available daily on a walk-in basis in the Undergraduate Advising Office (2181J LeFrak Hall).

Course Code Prefix—GVPT

Hearing and Speech Sciences

Professor and Acting Chairman: McCall
Professors: J. Baker (affiliate), Hall (affiliate), Lightfoot (affiliate), Newby (Emeritus), Penner (affiliate), Yeni-Komshian
Associate Professors: D. Baker, Dingwall, Hamlet
Assistant Professors: Bernstein-Ratner, Cicci (affiliate), Gordon-Salant, Roth, Soli (affiliate), Spekman (affiliate), Suter (affiliate)
Instructors: Daniel, Klevans, McCabe, Patrick, Perlroth, Wagner

Hearing and speech sciences is an inherently interdisciplinary field, integrating knowledge from the physical and biological sciences, medicine, psychology, linguistics, and education toward understanding human communication and its disorders. The department curriculum leads to the Bachelor of Arts degree. An undergraduate major in this field is an appropriate background for graduate training in speech-language pathology or audiology, as well as for graduate work in other disciplines requiring a knowledge of normal or disordered speech, language or hearing. The student who wishes to work professionally as a speech-language pathologist or audiologist must complete additional graduate coursework in order to meet state licensure and national certification requirements.

The department operates a Hearing and Speech Clinic (telephone: 454–2546), which serves the campus and surrounding area, and provides an in-house opportunity for the clinical training of students. Department facilities also include an integrated audio-visual listening and viewing laboratory, and several well-equipped research laboratories. Hearing and speech majors are invited to join the departmental branch of the National Student Speech-Language and Hearing Association (NSSLHA).

The hearing and speech sciences curriculum is designed in part to provide supporting coursework for majors in related fields, so most course offerings are available to both departmental majors and non-majors. Permission of instructor may be obtained for waiver of course prerequisites for non-majors wishing to take hearing and speech courses of interest.

A student majoring in hearing and speech sciences must complete 30 semester hours of specified courses and six (6) semester hours of electives in the department to satisfy major course requirements. No course with a grade less than C may count toward major course requirements. In addition to the 36 semester hours needed for a major, 12 semester hours of supporting courses in statistics, allied and other related fields are required. For these 12 hours, a C average is required.

Major Courses. Specified courses for a major in hearing and speech sciences (30 credits) are:

HESP 202—Introduction to Hearing and Speech Sciences (Introduction to Communication and Its Disorders)
HESP 300—Introduction to Psycholinguistics
HESP 311—Anatomy, Pathology and Physiology of the Auditory System
HESP 400—Speech and Language Development in Children
HESP 402—Speech Pathology I (Childhood Language and Articulation Disorders) *formerly HESP 302*
HESP 403—Introduction to Phonetic Science
HESP 404—Speech Pathology II (Stuttering and Oro-facial Anomalies)
OR
HESP 406—Speech Pathology III (Aphasia and Neuromotor Disorders)
HESP 407—Basis of Hearing Science
HESP 411—Introduction to Audiology

Electives in the department (6 credits) may be taken from among the following:

HESP 417—Principles and Methods in Speech-Language Pathology and Audiology
HESP 418—Clinical Practice in Speech-Language Pathology and Audiology
HESP 498—Seminar (various topics—check current listings)
HESP 499—Independent Study

The sequence of courses may vary. The student is encouraged to consult with a faculty advisor in the preparation of an individualized program plan of study. Information on advising for hearing and speech sciences may be obtained by calling the department office: 454–5831.

Supporting Courses. The undergraduate student with a major in hearing and speech sciences will take twelve (12) semester hours in supporting areas of study, including one of the following courses in statistics: EDMS 451, PSYC 200, or SOCY 201. The remainder of supporting courses are from allied fields such as psychology, linguistics, sociology, education, health, and anthropology (3 to 6 credits), and other related fields such as physics, zoology, engineering, philosophy, computer science, and biochemistry (3 to 6 credits). The student should see a faculty advisor in the Hearing and Speech Sciences Department for advice and approval of a supporting course sequence.

Course Code Prefix—HESP

Industrial Relations and Labor Studies Center

Director: Weinstein

The Industrial Relations and Labor Studies Center was organized in 1978 at UMCP and is concerned with two kinds of activity. The first is interdisciplinary research directed primarily toward the study of labor-management relations, employment, wages and related problems, the labor market, occupational safety and health, comparative studies and manpower problems. The Center draws on the expertise and interests of faculty from the College of Business and Management, the School of Law and the Departments of Economics, History, Psychology and Sociology. The second main activity consists of educational projects serving management, unions, the public and other groups interested in industrial relations and labor-related activities. These projects consist of public lectures, conferences, and symposia as well as non-credit courses.

International Development and Conflict Management

Director: Azar

The Center for International Development and Conflict Management is a research center focusing on the management and resolution of protracted conflict in the world today. Established in 1961, the Center has a staff composed of University faculty, visiting fellows and associates involved in study of contemporary international and intercommunal conflicts—their causes, dynamics, management strategies and peaceful resolution. The Center is located in the Mill Building.

Philosophy and Public Policy

Director: MacLean
Research Associates: Fullinwider, Lichtenberg, Luban, Sagoff, Segal, Shue

The Center for Philosophy and Public Policy conducts research into the values and concepts that underlie public policy formulation. Most research efforts—on topics expected to be a focus of public policy debate during the next decade—are conducted cooperatively by interdisciplinary working groups composed of philosophers, policymakers and analysts, other experts from within and without the government, and Center staff. In its research and curriculum development, the Center seeks to create an improved understanding of the normative principles that are basic to an assessment of public policies.

The Center's curriculum development seeks to bring philosophical issues before future policymakers and citizens. Courses dealing with contemporary normative issues in the national and international arena are offered through the Departments of Philosophy and of Government and Politics, and through the Honors Program. Courses which have been offered include Hunger and Affluence, Human Rights and U.S. Foreign Policy, Distributive Justice and Public Policy, Philosophical Issues in Public Policy, The Morality of Compulsory Military Service, Environmental Ethics, Energy Policy and the Constraints of Justice, Ethics and the New International Order, Risk and Consent, and the Endangered Species Problem: A Philosophical Approach.

The Center is sponsored jointly by the Divisions of Arts and Humanities and of Behavioral and Social Sciences.

Psychology

Professor and Chairman: Goldstein
Professors: Anderson, Carta-Porges (affiliate), Dies, Fein (affiliate), Fretz, Gelso, Gollub, Gross, Hall, Hill, Hodos, Horton, Isen (affiliate), Levinson, Lightfoot (affiliate), Lissitz (affiliate), Locke* (Business and Management), Lorion, Magoon, Martin, McIntire, J. Mills, Penner, Porges (affiliate), Pumroy, Schneider, Scholnick, Sigall, B. Smith, Steinman, Sternheim, Taylor, Torney-Purta (affiliate), Trickett, Tyler, Waldrop (Emeritus)
Associate Professors: Brauth, R. Brown, Coursey, Dooling, Egel (affiliate), Freeman (affiliate, Counseling Center), Helms, Larkin, Norman, Schneiderman (affiliate), Steele, Yeni-Komshian (affiliate)
Assistant Professors: Allen, Johnson, Kivlighan (affiliate, Counseling Center), O'Grady, Plude, Schoorman, Soli, Zamostny (affiliate, Counseling Center)

* *Joint appointment with unit indicated.*

Psychology can be classified as a biological science (Bachelor of Science degree) and a social science (Bachelor of Arts degree) and offers academic programs related to both of these fields. The undergraduate curriculum in psychology provides an organized study of the behavior of man and other organisms in terms of the biological conditions and social factors which influence such behavior. In addition, the undergraduate program is arranged to provide opportunities for learning that will equip qualified students to pursue further study of psychology and related fields in graduate and professional schools.

Students who are interested in the biological aspects of behavior tend to choose a program leading to the Bachelor of Science degree, while those interested primarily in the social factors of behavior tend to choose the Bachelor of Arts degree. The choice of program is made in consultation with an academic advisor.

Department requirements are the same for the Bachelor of Science and the Bachelor of Arts degrees. A minimum of 35 hours in psychology courses, including 14 hours at the 400 level, must be taken. PSYC 478 and 479 may *not* be included in the 35 credit minimum or used to meet the 400 level requirement. Courses taken must include PSYC 100, 200, and two laboratory courses (PSYC 400, 410, 420 or 440).

In order to assure breadth of coverage, courses in the department have been divided into four areas. The 35 credit total must include at least two courses from each of at least two of four areas and at least one course from each of the remaining areas.

The areas and courses are:
Area I: 206, 301, 310, 400, 401, 402, 403, 404, 405, 410, 412, 453. *Area II:* 221, 420, 421, 422, 423, 424, 440, 441, 442, 443, 444, Honors 430C. *Area III:* 331, 335, 337, 355, 356, 357, 431, 435, 456, 458 and *Area IV:* 336, 361, 451, 452, 460, 461, 462, 463, 464, 465, 466, 467.

Students who wish to receive the Bachelor of Science degree must complete a 15 credit supporting sequence in relevant math and/or science courses with a 2.0 average or above. The 15 credits must include two laboratory courses and a total of 9 credits in mathematics and/or science at the advanced level. The student should see an academic advisor in the Psychology Department for advice and approval of a course sequence. Students should consult the current *Psychology Undergraduate Program Guide* for a list of approved advanced math-science courses. This guide is available in the Psychology Undergraduate Office (Room ZP 1141). Advising appointments may be made by calling (301) 454–6691.

A grade of C or better must be earned in the 35 credits of psychology courses counted toward the major or a course must be repeated until a C or better is earned. If the course is not repeated then another psychology course fulfilling the same requirements would have to be substituted. The departmental grade point average will be a cumulative computation of *all* grades earned in psychology and must be a 2.0 or above.

Students desiring to enter graduate study in certain areas of psychology are advised to take an additional laboratory course and/or participate in individual research projects. Ample opportunity is provided for students to gain experience by serving as research assistants to faculty members in the department. Students interested in graduate study should consult an advisor to discuss various programs and their prerequisites.

It should be noted that there is one course content area which has two courses, one in the 300 sequence and one in the 400 sequence. These courses are abnormal (331 and 431) and personality (335 and 435). The courses in the 300 sequence provide general surveys of the field and are intended for non-majors who do not plan further in-depth study. The courses in the 400 sequence provide more comprehensive study with particular emphasis on research and methodology. The 400 series is intended primarily for psychology majors. It should be further noted that a student may not receive credit for both:

PSYC 331 and PSYC 431
PSYC 335 and PSYC 435

Honors. The Department of Psychology also offers a special program for the superior student which emphasizes independent study and research. Students who have a 3.3 grade average in all courses, who are in the junior year, and who demonstrate interest and maturity indicative of success in the program are encouraged to apply. Students in their sophomore year should consult the director of the Psychology Honors Program for further information.

Student Activities. The College Park Chapter of Psi Chi, the National Honor Society in Psychology, actively sponsors workshops, field trips and social events open to all students.

Special Facilities. Computer terminals, connected to the University computer system, are available in Room ZP 1140 for student use.

Course Code Prefix—PSYC.

Sociology

Professor and Acting Chairman: Dager
Professors: Billingsley* (Afro-American Studies), Clignet (affiliate), Goldsmith (adjunct), Janes (Emeritus), Hage, Kammeyer, Lejins (Emeritus), Presser, Ritzer, Robinson, Rosenberg, D. Segal, Silbergeld (adjunct)
Associate Professors: Brown, Finsterbusch, Henkel, Hirzel, J. Hunt, L. Hunt, Landry* (Afro-American Studies), Lengermann, McIntyre, Meeker, Parming, Pease, M. Segal, Vanneman
Assistant Professors: Canjar, Falabella, Fleishman, Harper, Imamura, Snipp
Lecturer: Altman

* *Joint appointment with unit indicated.*

Sociology is the scientific study of society, its institutions, organizations and groups. Beginning with the simple interaction between two or more people, sociology examines the social organization of society from the development of social order to the causes and impact of social change. Sociology's subject matter ranges from the study of the social factors that affect the self-concept and the nature of sex roles at the individual level to group processes, to organizations designed to produce products or provide services to the major institutions of society. In the latter category the department has strengths in the study of the military, family, education, health, welfare, and political and economic organizations. At the societal and world system level, the department looks at social movements, the basis of stratification or inequality, sources of instability, war, technology, and a number of other issues.

A major in sociology offers (1) a general education especially directed toward understanding the complexities of modern society and its social problems by using basic concepts, research and statistical skills, (2) a broad preparation for various types of professions, occupations, and services dealing with people, and (3) preparation of qualified students for graduate training in sociology, social work, law, and business. Sociology also forms a valuable background for those interested in other fields or majors. Courses in sociology can be used as preparation for careers in government and private research, urban planning, personnel work, human resources management, and many other policy-making and administrative careers.

Areas of Specialization. The program of instruction in sociology offers course sequences in eight areas. The strong emphasis on advising in the department allows the student to combine these areas into individualized programs directed toward the student's specific goals. Specializations are available in social science research methodology, social psychology, social demography, family sociology, organizations and occupations, military sociology, social stratification, and community.

Social Science Research Methodology. This specialization provides the student with strong statistical and methodological background and hands-on computer skills needed for all forms of social science research from evaluation research to opinion polls. Additional courses from the social demography specialization prepare the student for employment in governmental organizations such as the Census Bureau or the National Center for Health Statistics.

Social Psychology. This option combines courses on the self concept, personality, collective behavior and small group analysis. Such a concentration is valuable for helping occupations in business organizations as well as social welfare agencies.

Social Demography. Demography focuses on careful, objective and systematic study of the population, its size and characteristics, and how it changes in number, composition, and residence. This information and the skills that produce it are valuable for government or business to allow for planning effectively.

Family Sociology. This specialty examines the development of sex roles, the organization and changes in our family institution as well as the relationship of the family to the social structure. Specific coursework in areas of childhood socialization, aging and disability focus on family problem areas. Along with the social psychology specialization, family sociology is a good preparation for human services, counseling, and research occupations.

Organizations and Occupations. This concentration is particularly useful to pursuit of careers in the business world. It involves theoretical instruction in formal organization, bureaucracy, social stratification and is applicable to any institution organized in bureaucratic form such as education, politics, business, military. Another facet of this specialization is the broad area of work roles and occupations, their meaning, development, professionalization, and place in the social structure.

Military Sociology. Very closely associated with the organizations and occupations specialty, military sociology uses concepts associated with bureaucratic organization, social control, and even sex roles to examine our military institution. With the importance of the military in the world today, this is a rapidly growing speciality area.

Social Stratification. Provides students with a macro view of society emphasizing the social divisions of age, sex, race as well as occupation, wealth, power and prestige on the classification systems societies develop.

Community. Coursework related to the organization and social structure of communities, both rural and urban, in present day society, addresses issues faced by local communities, the influence of community on social institutions, and the possible future of the community in the United States. As with social demography, military sociology, and social stratification concentrations, community is a valuable specialization for policy-making occupations.

These areas of concentration can be combined to advantage or can be taken as part of a double major in conjunction with programs in other compatible areas such as economics, government and politics, psychology, business, etc. This program versatility and the rich experiential learning possibilities of the Washington Metropolitan Area combine to make the sociology curriculum a valuable career choice.

Requirements of the Sociology Major. The student in sociology must complete 47* hours of departmental requirements, none of which may be taken pass/fail. Thirty-two* of these hours are in sociology coursework which must be completed with a minumum average of C; 14* hours are in required core courses and 18 hours are sociology electives, of which 9 are required at the 400 level and an additional 3 are required at either the 300 or 400 level. Required core courses for all majors are SOCY 100 (Introduction), SOCY 201 (Statistics), SOCY 203 (Theory), and SOCY 202 (Methods).

SOCY 100 should be taken in the freshman or sophomore year followed by SOCY 203. Three hours of mathematics (STAT 100, MATH 110, 111, 115, 140, 220 or their equivalents) are required of majors as a prerequisite of SOCY 201. SOCY 202 follows SOCY 201.

The supporting course requirement for majors is 12 hours of a coherent series of courses from outside of the department which relate to the student's major substantive or research interests. These courses need not come from the same department, but at least 6 hours must be from the Division of Behavioral and Social Sciences. It is strongly recommended that the student work out an appropriate supporting sequence for the particular specialization with the departmental advisor.

Internship. Although internships are not a requirement for a major, students are strongly urged to consider the internship program offered by the department or through the Experiential Learning Office located in Hornbake Library. Majors may receive up to six (6) credits in SOCY 386/387 by the combination of working in an internship/volunteer position plus doing some academic project in conjunction with the work experience.

Further information on coursework, internships, honors program, careers, and other topics may be obtained from the Sociology Undergraduate Advisor, Room 2108 Art/Sociology Building, telephone number 454–5036.

** 47 hours are required because SOCY 201 and 202 are 4-hour courses. For transfer students or those with equivalent courses which are only 3-hour courses, exceptions to this 47-hour requirement may be made by the Coordinator of the Sociology Undergraduate Program.*

Course Code Prefix—SOCY

Survey Research Center

Director: Robinson
Field Coordinator: Dowden
Faculty Research Assistant: Triplett
Data Manager: Holland

The Survey Research Center was created in 1980 as a Division-wide research facility within the behavioral and social sciences. The Center specializes in the design of questionnaires and the conduct of surveys for policy purposes, and has the capacity to conduct mini-surveys, survey experiments, and in-depth clinical interviews. The Center annually conducts the Maryland Poll, a sampling of public opinion across the State on important issues to Maryland citizens. It also conducts periodic surveys of the Baltimore-Washington region and shares results of these surveys nationally through the Network of State Polls. The Center provides assistance to researchers in sample design, has technical expertise on the storage, manipulation, and analysis of very large data sets, and provides support services to archive and maintain such data sets.

The Center supports graduate education by prroiding both technical training and practical experience to students. Also, the Center has a strong community service mission through the provision of technical assistance on survey methods and survey design to units of state and local governments, and by conducting surveys on a contract or grant basis for these governmental units.

Urban Studies

Professor and Director: Corey
Professors: Marando, Stone* (Government and Politics)
Associate Professor: Christian* (Geography)
Assistant Professor: Howland
Lecturers: Laidlaw, Williams
Affiliate Faculty: Baum, Brower, Florestano, Fogle, Levin, Zeigler

** Joint appointment with unit indicated.*

The Institute for Urban Studies offers a program of study leading to the Bachelor of Arts degree in urban studies. The program is designed to encourage students either (1) to direct their learning toward planning and management careers in metropolitan-area organizations, or (2) to study urbanization processes and methods as a means toward earning a general education. The undergraduate urban studies program is built on several introductory and methods courses that examine the city in its metropolitan, interregional, national and international policy contexts. The problems of planning and management of the metropolis are stressed. Students are encouraged by the multidisciplinary urban studies faculty to take advantage of the rich and extensive cross-departmental resources of the University's College Park Campus. An urban-related specialization from another discipline is selected, in addition to coursework in the behavioral and social sciences, urban studies students should consider appropriate coursework in: Afro-American Studies, Architecture, Civil Engineering, Family and Community Development, Geography, History, Housing and Design, Recreation, Computer Science, Government and Politics, Economics, Business, and other related departments. Integrative metropolitan problem-solving, planning, and management experiences, such as an internship and a planning workshop, are provided. Each student, working closely with the urban studies undergraduate advisor, designs a program of study based on interests and future career plans. Inasmuch as the Institute exists to serve the planning and management personnel and research needs of metropolitan organizations in the non-profit, for-profit and governmental sectors, career guidance and job placement have a high priority. To that end, internships are encouraged. Students are provided with assistance in finding available vacancies, with resume writing and interview preparation. URBS majors are prepared to enter the professional arena or to continue with advanced study. Urban Studies graduates continue to have a high job placement rate. The undergraduate advisor is located in Room 1123, LeFrak Hall, the advisor's telephone is 454–2488.

Requirements for an URBS Undergraduate Major. The Urban Studies major consists of a total of 42 semester credit hours in which the student must earn a C or better in each course. The division of requirements is as follows:

	Credit Hours
I 5 URBS core courses	15
II 2 URBS advanced specialization courses	6
III 7 Supporting courses	21
Total	42

I. Required URBS Core Courses (5 courses, 15 credits):
- A. URBS 100—Introduction to Urban Studies (or GEOG 150)
- B. URBS 210—Behavioral and Social Dimensions of the Urban Community
- C. URBS 220—Environmental and Technological Dimensions of the Urban Community
- D. URBS 350—Quantitative Methods in Urban Studies
- E. URBS 410—The Development of the American City (or URBS 320, or GEOG 350)
  OR
  URBS 450—Urban Law

II. Required URBS Advanced Specialization Courses (2 courses, 6 credits):

URBS 440—City and Regional Economic Development Planning (or URBS 488E by petition)
URBS 470—Management and Administration of Metropolitan Areas (or URBS 488M, or URBS 488B)

III. Supporting Courses (7 courses, 21 credits):
Choose from URBS 438, URBS 460, URBS 480, URBS 488 (Selected Topics), and additional upper-division courses from other departments throughout the campus which support the student's planned supporting specialization. Supporting courses may be selected from Geography, Architecture, Family and Community Development, Housing and Design, Economics, Sociology, Criminology, or other urban-related units.

There is encouragement of innovative supporting-course designs that are tailored individually to the particular needs of the student. These designs are developed with an advisor in the Institute for Urban Studies.

Internship in URBS. Given the career focus of the Institute, internships are encouraged. Although the six credits for the internship do not count towards the URBS major requirements, they are counted as elective credit. However, concurrent registration for 399A is possible and the three credits for this independent study may be used towards fulfilling the supporting course requirement. The course is open both to majors and non-majors, however, at least second-semester sophomore status is required. The Institute has an extensive list of over 130 possible placements for students. In addition, students may seek out their own placements, contingent upon the approval of the Internship Coordinator. Some of these organizations include the City of Rockville, The United Way, Montgomery County, the US Department of Housing and Urban Development, the Maryland National Park and Planning Commission and the Maryland General Assembly. More information and an application form may be obtained from the Institute, or from Mrs. Barbara Williams, Intern Coordinator, Room 1113, LeFrak Hall, telephone 454–2662.

Honors in URBS. For information on the Urban Studies Honors program, contact Professor Marando, 1119 LeFrak Hall, 454–6687 or the Undergraduate Advisor, 1123 LeFrak Hall, 454–2488.

Facilities. See the geography program description for the special facilities also available to urban studies students.

Course Code Prefix—URBS

Division of Human and Community Resources

Provost: Sloan

The Division of Human and Community Resources includes the faculties and programs of the College of Education, the College of Human Ecology, the College of Physical Education, Recreation and Health, and the College of Library and Information Services. The programs of the Division are essentially professional. They are designed to prepare professionals interested in the quality of life of the individual and in the community factors which influence the interaction of people, those who are responsible for community health, recreation programs and activities, technical, public and school librarians, information scientists, and educational institutions.

The Division supports the development of research in areas of concern to faculty members in all the Departments and Colleges, and research teams which may cross departmental and College lines. Also, the Division seeks to stimulate the development of interdisciplinary courses and programs and the extension of professional expertise to the University and community at large.

The Division offers bachelor's, master's, and doctorate degrees in most of its programs in addition to various professional certificates. The professional programs are accredited by the National Council for Accreditation of Teacher Education, the Maryland State Department of Education, the American Library Association Committee on Accreditation, and the American Home Economics Association.

Specifically, the Colleges and their respective departments in the Division are:

College of Education. Department of Education Policy, Planning and Administration, Department of Counseling and Personnel Services, Department of Curriculum and Instruction, Department of Industrial, Technological and Occupational Education, Department of Measurement, Statistics and Evaluation, Department of Special Education, and Institute for Child Study.

College of Human Ecology. Department of Family and Community Development, Department of Food, Nutrition and Institution Administration, Department of Housing and Design, Department of Textiles and Consumer Economics.

College of Library and Information Services. This College is a separate professional College committed solely to graduate study and research.

College of Physical Education, Recreation and Health. Department of Health Education, Department of Physical Education, and Department of Recreation.

Center on Aging

The Center on Aging stimulates and supports aging-related activities within existing departments, colleges, and schools throughout the various campuses of the University. The Center coordinates the Graduate Gerontology Certificate (Master's and Doctoral levels), the University's first approved graduate certificate program. The Center assists undergraduate and graduate students interested in the field of gerontology and helps them to devise educational programs to meet their goals. The Center has become one of the nation's foremost applied-gerontology trainers. It also sponsors a colloquium series on aging, conducts community education programs, assists faculty in pursuing research activities in the field of aging, publishes a newsletter, conducts conferences on adulthood and aging-related topics, and provides on- and off-campus technical assistance to practitioners who serve older adults.

Intensive Educational Development Program

The Intensive Educational Development Program (IED) is a supportive service program designed to provide comprehensive services to freshmen and sophomores currently enrolled in The University of Maryland College Park, and to high school seniors seeking admission to the University. Specifically, the program is designed to provide services in the areas of English, study skills, math, counseling, academic advising and tutoring. The program encourages students to utilize all program and University services which would enable them to develop their intellectual, personal, social, and economic potential.

All prospective students attempting to gain entrance to the University by participation in the program are required to participate in the six-weeks Summer Transitional Program that is designed to develop, expand, and improve the individual's skills in English, math, and study skills; provide a learning experience that will assist the students in the transition from high school to the University; and provide an opportunity to challenge and further evaluate each student's potential for success at this University.

Following the initial summer component and throughout the academic year, IED lends support for all students on the College Park Campus through a free, comprehensive tutoring program; sound academic advisement, continuing development of English, math, reading, and study skills; and personal counseling. Hourly math exam reviews are scheduled, as well as workshops on time management, note taking and theme writing.

Intensive Educational Development Program, Room 0111, Chemistry Building. Phone 454–4646, 4647.

Upward Bound Program

The University of Maryland Upward Bound Program is designed to provide academic and counseling assistance to capable but underachieving high school students with the purpose of preparing them to pursue some form of post-secondary education. Upward Bound serves as a supplement to its participants' secondary school experiences. It provides the opportunity for each student to improve or develop the skills necessary for acquiring a positive self-image, broadening his/her educational and cultural perspective, and for identifying and actualizing undiscovered potentials.

Upward Bound students are selected from high schools in Prince George's and Montgomery Counties, and are recommended to the program through high school principals, teachers, counselors, talent search, social service agencies, and individuals knowledgeable about the program. The academic skills development and counseling services are available to students throughout the school year and during the summer program. Academic instruction, tutoring, counseling and other related innovative educational experiences are provided for the purpose of developing basic academic skills and motivation necessary for success in secondary schools and to assure that each student gains a minimum of one year's growth in the basic skills areas of communication and mathematics.

Persons interested in further information regarding the Upward Bound Program should contact The Director of Upward Bound, Room 2101, West Education Annex, The University of Maryland, College Park, Maryland 20742. Telephone Number 454–2116.

College of Education

Dean: Scannell

The College of Education offers programs for persons preparing for the following educational endeavors: (1) teaching in colleges, secondary schools, middle schools, elementary schools, kindergarten and nursery schools; (2) teaching in special education programs; (3) school librarians and resource specialists; (4) educational work in trades, industries and other non-school settings; (5) pupil personnel counseling and guidance services; (6) supervision and administration; (7) curriculum development; (8) rehabilitation programs; (9) evaluation and research; (10) government agencies, policy groups, and professional associations.

The College is committed to continuous research and evaluation in relation to teaching and learning. Undergraduate programs of the College of Education contribute to the enhancement of research. From time to time various experimental processes may be in place within program components and students may be invited to actively participate with graduate students and faculty members in research undertakings and evaluation processes.

Because of the location of the University in a suburb of the nation's capital, unusual facilities for the study of education are available to its students and faculty. The Library of Congress, the library of the United States Department of Education, and special libraries of other government agencies are accessible, as well as the information services of the National Education Association, the American Council on Education, United States Department of Education, and other organizations, public and private. The school systems of the District of Columbia, Baltimore and the counties of Maryland offer generous cooperation.

All bachelor-degree teacher preparation programs are accredited by the National Council for Accreditation of Teacher Education and have been approved by the Division of Certification and Accreditation of the Maryland State Department of Education using standards of the National Association of State Directors of Teacher Education and Certification. Accreditation provides for reciprocal certification with other states that recognize national accreditation. The graduate degree programs preparing school service personnel (elementary and secondary school principals, general school administrators, supervisors, curriculum coordinators, guidance counselors, student personnel administrators, and vocational rehabilitation counselors) at the master's, advanced graduate specialist and doctoral degree levels are fully accredited by the National Council for Accreditation of Teacher Education.

Admission. All students desiring to enroll in the College of Education must apply to the Director of Undergraduate Admissions of The University of Maryland College Park (UMCP) and meet the admissions requirements detailed below. Students entering with less than 45 credit hours will be admitted as "pre-education majors." Students who intend to teach (except agriculture, health, and physical education) should enroll in the College of Education in order that they may have continuous counsel and guidance from advisors who are responsible for teacher education at The University of Maryland. Students desiring a major in agriculture and extension education should apply to the College of Agriculture, and those desiring a major in health or physical education should apply to the College of Physical Education, Recreation and Health.

There are no specific secondary school course requirements for admission but a foreign language is desirable in some of the programs, and courses in fine arts, trades, and vocational subjects are also desirable for some programs. Students with baccalaureate degrees who have applied for admission as special students must have received prior permission from the appropriate department. A student on the College Park Campus may become a pre-education major at any time, however, it is recommended that this transfer occur prior to the junior year because of the requirements established for admission to Teacher Education and the required sequence of professional courses and experiences. Students attending Maryland community colleges are encouraged to follow the articulated programs to accommodate transferring to UMCP.

Admission to Teacher Education. Pre-education majors must make application for admission to teacher education at the UMCP Office of Undergraduate Admissions immediately upon completing 45 semester hours of credit. Transfer students with 45 or more semester hours of acceptable credit must apply at time of transfer. Post-graduate certification students must apply at the beginning of their program. Application forms may be obtained from the Office of Undergraduate Admissions.

For admission into a teacher education program, a student must (1) complete the USP Fundamental Studies requirements (6 credits); (2) earn 45 semester hours with an overall cumulative grade point average of at least 2.5 on a 4.0 scale (granted by UMCP or other institution) in all coursework prior to enrollment in EDHD 300, and (3) have a satisfactory score on the language and mathematics segments of the California Achievement Test Level 20. Individuals who do not initially meet the criteria for admission to teacher education will be given an additional semester in which to become eligible. A plan for attaining eligibility will be developed by the student and the department advisor.

Once the student has been admitted into the professional program, required courses must be completed in an appropriate sequence leading to the required teaching internship (student teaching experience). Prior to assignment to the internship, all students in teacher preparation programs must (1) have maintained an overall grade point average of at least 2.5 with a minimum grade of C in every course required for the major, (2) submit to the Office of Laboratory Experiences an application for student teaching; (3) be recommended by their department; and (4) have on file favorable ratings from prior supervised experiences in school settings including evaluations on the EDHD 300 field experiences.

A health certificate certifying absence of communicable disease is required for participation in any education course with a field experience. The purpose of the screening procedures associated with admission to professional teacher preparation programs is to insure that graduates of the programs will be trained in a research environment, will be well prepared for teaching, and can be recommended for certification with confidence.

The admission, advancement and retention criteria apply to all UMCP students following a teacher preparation program including the various majors in the College of Education, the College of Agriculture, and the College of Physical Education, Recreation and Health as well as all majors in other academic programs who are simultaneously fulfilling professional teacher program requirements along with requirements of their primary degrees. A Teacher Education Appeals Board will review appeals from students who do not meet the admission, advancement or retention criteria. An appeal for admission review is submitted initially at the UMCP Office of Undergraduate Admissions. An appeal for advancement and retention review may be initiated with your program advisor.

Student Teaching. The student teaching experience is for most students the final experience in a professional program preparing them for the beginning teaching years. This culminating phase of the teacher education program provides the prospective teacher with the opportunity to integrate theory and practice in a comprehensive, reality-based, experience. Student teaching placements, as well as all other field experiences, are arranged by the Office of Laboratory Experiences. Prior to receiving a student teaching placement, prospective student teachers must have been admitted to teacher education and have completed requirements as described in the previous section.

Most student teaching placements and accompanying seminars are arranged in the Teacher Education Centers and other collaborative field sites jointly administered by the College of Education and participating school systems. Prospective student teachers are reminded that student teaching together with the seminar is a full time commitment, consequently students are restricted from outside employment or enrollment in other coursework during the student teaching experience. Students should contact the Office of Laboratory Experiences if there are any questions regarding this policy.

The Office of Laboratory Experiences is a service unit designed to provide quality field placements, in schools and other agencies, to students and faculty interested in the study of education. This office serves the functions of program liaison, staff development, and research facilitation in regard to field experiences. The office also arranges on-campus tuberculosis testing in the Benjamin Building for the convenience of students and faculty. Student teaching information and application meetings are held each semester. Placement assistants are always available to assist students with their questions or concerns regarding all field placement matters.

Graduation Requirements of the College. Minimum requirements for graduation are 120 semester hours. Specific program requirements for more than the minimum must be fulfilled.

In addition to the University Studies Program requirements and the specific requirements for each curriculum, the College requires EDHD 300, EDPA 301, and 3 semester hours of an approved speech course.

A grade of C or better is required in (1) every education course; (2) all academic courses required in the major and minor; and (3) the required speech course. An overall grade point average of 2.5 must be maintained after admission to Teacher Education. A grade of S is required in student teaching.

Exceptions to curricular requirements and rules of the College of Education must be recommended by the student's advisor, and department chairperson, and approved by the dean.

Students who are not enrolled in the College of Education but, who through an established cooperative program with another college, are preparing to teach and wish to register in professional education courses required for certification must meet all admission, scholastic and curricular requirements of the College of Education.

Certification of Teachers. The Maryland State Department of Education issues certificates to teach in the public schools of the State. Graduates of approved programs within the College will automatically meet the requirements for State Department certification. The College of Education is also approved by the National Council for Accreditation of Teacher Education (NCATE).

Degrees. The degrees of Bachelor of Arts and Bachelor of Science are conferred by the College of Education. The determination of which degree is conferred is dependent upon the amount of liberal arts study included in a particular degree program.

Center for Educational Research and Development (CERD). CERD provides opportunities for educators to conduct basic research projects which are intended to contribute to the store of knowledge about the purposes, functions, and operations of educational programs. The Center's applied research projects focus on current policy issues and educational problems.

Curriculum Laboratory. The Curriculum Laboratory is a model learning resource center serving the information needs of preservice and inservice teacher education students. Included in the collection are curriculum guides, reference and professional books, elementary and secondary textbooks, exemplary instructional materials, research documents, standardized test specimens, and professional journals.

Educational Technology Center. The center is designed as a multi-media facility for students and faculty of the College. It distributes closed-circuit television throughout the building, provides audio-visual equipment and service, a computer terminal, a learning lab, and instruction in all aspects of instructional materials, aids, and new media. Production and distribution rooms and a studio are available for closed-circuit television and a video tape system. Laboratories are available for graphic and photographic production with facilities for faculty research and development in use of instructional media. Supporting the professional faculty in the operation of the center are media specialists.

Institute for the Study of Exceptional Children and Youth. The Institute, adjunct to the Department of Special Education, is a problem-centered organization engaged in innovation, research, and evaluation related to major issues affecting the lives of exceptional individuals—the gifted and talented as well as the handicapped. Some of the current projects address microcomputers and related technology, leadership policy personnel preparation, and programs for the gifted and talented.

Mathematics Center. The Center provides a mathematics laboratory for undergraduate and graduate students, and a program of clinical diagnostic and corrective/remedial services for children. Clinic services are a part of a program in elementary school mathematics at the graduate level.

Music Educators National Conference Historical Center. The University of Maryland and the Music Educators National Conference established the MENC Historical Center in 1965 for the purpose of building and maintaining a research collection which would reflect the development and current practices in music education. Located in McKeldin Library, the center includes study space and is prepared to assist scholars in the field. Materials in the following categories are collected: archival documents of MENC, instructional materials, professional publications; curricular, administrative, and philosophical materials, manuscripts, personal letters and other historical materials.

Center of Rehabilitation and Manpower Services. The Center of Rehabilitation and Manpower Services is one of the operating Divisions of the Department of Industrial, Technological and Occupational Education. The Center was established in 1968 as a joint project of the Department of H E W and the University. The Center receives support from federal, state and private sources to carry out its mission of improving the vocational training and skills of mentally and physically handicapped students and adults in Maryland, Delaware, Virginia, Pennsylvania, West Virginia and the District of Columbia. The Center conducts short-term training institutes for teachers, administrators, counselors, vocational evaluators, and supervisors to upgrade their skills. Consultative services are provided to agencies and systems interested in improving their planning and management policies. The Center also serves as a multi-media resource providing and developing materials specifically related to the career and vocational training of handicapped people.

Program content, professional issues and participant concerns are integrated into seminar designs to enable the greatest possible gain in new skills, information and insight in problem resolution. This approach to learning requires limited enrollment to insure the quality of learning. Seminars utilize participative learning techniques such as simulations, role plays, small group exercises, brainstorming, lectures, practicums, case studies, demonstrations, in-baskets, games and critical instances.

Center for Young Children. A demonstration nursery-kindergarten program (1) provides a center in which individual professors or students may conduct research, (2) serves as a unit for undergraduate students to have selected experiences with young children, such as student teaching, child study, and observation of young children, (3) provides a setting in which educators from within and without the University can come for sources of ideas relative to the education of young children.

Reading Center. The Reading Center provides clinical diagnostic and corrective services to a limited number of children. These services are a part of the program in corrective/remedial reading offered to teachers on the graduate level.

Science Teaching Center. The Science Teaching Center has been designed to serve as a representative facility of its type to fulfill its functions of undergraduate and graduate science teacher education, science supervisor training, basic research in science education, aid to inservice teachers and supervisors, and consultative services, on all levels, kindergarten through community college. Its reference library features relevant periodicals, science and mathematics textbooks, new curriculum materials, and works on science subjects and their operational aspects. Its fully equipped research laboratory, in addition to its teaching laboratories for science methods courses, provides project space for both faculty and students.

Since 1962 the Science Teaching Center has served as the headquarters for the activities of the Science Teaching Materials Review Committee of the National Science Teachers Association, The Information Clearinghouse on Science and Mathematics Curricular Developments, the International Clearinghouse for A A A S, N S F, and UNESCO, started here that year also. Within the center is gathered the "software" and "hardware" of science education in what is considered to be one of the most comprehensive collections of such materials in the world.

Vocational Curriculum Research and Development Center. Located within the Department of Industrial Education, the center provides leadership in research and development, resources, and supportive services for individuals and groups engaged in industrial, vocational, and technical education curriculum development. Available resources include curriculum guides, textbooks, course outlines, learning activity packages, teaching aids, professional journals, reference books, and catalogs representing local, state, and national curriculum trends.

Study carrels and instructional media facilities are provided for students, faculty, local teachers and specialists engaged in vocational curriculum research, development and assessment. The center maintains linkages with similar regional and national agencies concerned with vocational curriculum research and development.

Student and Professional Organizations. The College sponsors a chapter of Phi Delta Kappa, a Student National Education Association and a Chapter of Kappa Delta Pi, an Honorary Society in education. A student chapter of the Council for Exceptional Children is open to undergraduate and graduate students in Special Education. A student chapter of the Music Educators National Conference (MENC) is sponsored by the Department of Music, and the Industrial Education Department has a chapter of the American Society of Tool and Manufacturing Engineers and a chapter of the American Industrial Arts Association.

In several departments there are informal organizations of students.

Career Development Center, University Credentials Service. All seniors graduating in the College of Education (except Industrial Technology majors) are required to file credentials with the Career Development Center. Credentials consist of the permanent record of a student's academic preparation and recommendations from academic and professional sources. An initial registration fee enables the Career Development Center to send a student's credentials to interested educational employers, as indicated by the student.

Students who are completing teacher certification requirements, advanced degrees and are interested in a teaching, administrative or research position in education, or who are completing advanced degrees in library science, may also file credentials.

Other services include vacancy listing in secondary schools and institutions of higher learning, notifications of interest-related positions, on-campus interviews with state and out-of-state school systems, and descriptive information on school systems throughout the country.

This service is also available to alumni. For further information contact the Career Development Center, Hornbake Library, or phone 454–2813.

College of Education Departments, Programs and Curricula

Counseling and Personnel Services

Professor and Chairman: Hershenson
Professors: Birk, Magoon, Marx, Pumroy, Schlossberg
Associate Professors: Allan, Freeman, Greenberg, Hoffman, Knefelkamp, Lawrence, Leonard, Medvene, Power, Rhoads, Scales, Spokane, Teglasi, Westbrook
Assistant Professors: Boyd, Lucas, Mullison, Strein, Thomas, Waldo

Programs of preparation are offered by the Department of Counseling and Personnel Services at the master's degree, advanced graduate specialist, and doctoral degree levels for counselors in elementary and secondary schools, rehabilitation agencies, community agencies, business and industry and college and university counseling centers. The Department also offers graduate programs of preparation for other personnel services college student personnel administrators, pupil personnel workers, and school psychologists. The Department offers a program jointly with the Department of Psychology which leads to a Ph D in counseling psychology.

While the Department does not offer an undergraduate major, it does offer a number of courses which are open to undergraduates and are suggested for students considering graduate work in counseling or other human service fields.

Course Code Prefix—EDCP

Curriculum and Instruction

Professor and Chairperson: Arends
Professors: E G Campbell, Carr, Fein, Fey, Folstrom, Guthrie, Holliday, Layman, Lockard, Roderick, Sublett, Weaver, Wilson
Associate Professors: Amershek, Borko, Brigham, Church, Cirrincione, Craig, Davey, Davidson, DeLorenzo, Dreher, Eley, Farrell, Gambrell, Garner, Heidelbach, Henkelman, Heikkinen, Herman, Jantz, Johnson, McCaleb, McWhinnie, Saracho, D Williams
Assistant Professors: P Campbell, Cole, Gillingham, Markham, Shelley, Slater, H Williams, Young
Emeritus Faculty: Blough, Duffey, Leeper, Risinger, Schindler, Stant

The Department of Curriculum and Instruction offers three undergraduate curricula leading to the Bachelor of Science degree:

1. Early Childhood Education—for the preparation of teachers in preschool, kindergarten and primary grades (grades one, two and three)
2. Elementary Education—for the preparation of teachers of grades one through six
3. Secondary Education—for the preparation of teachers of grades seven through twelve in numerous specialization areas

Advising is mandatory for all students. Before students can enroll in any of the professional courses in Curriculum and Instruction (except EDCI 280), they

must first gain admission to the College of Education's Teacher Education Program and arrange for advising. Admission procedures and criteria are explained in "Admission to Teacher Education" in the section headed College of Education. For more information students should contact the Department's Advising Office, 454-7346.

The Department also has an experimental Teacher Education Program leading to certification and a master's degree. Interested students should contact the Department's Advising Office for details.

Early Childhood Education (Preschool-Kindergarten-Primary). The Early Childhood Education curriculum has as its primary goal the preparation of preschool, kindergarten and primary teachers.

Observation and student teaching are done in the University Center for Young Children on the campus and in approved schools in nearby communities.

Graduates receive a Bachelor of Science degree and meet the requirements for teaching kindergarten, preschool and primary grades in Maryland, the District of Columbia, and many states. Students should have had extensive experience in working with children prior to the junior year.

The following list of courses is presented as a sample program. All departmental academic requirements listed in Semesters I through IV must be completed with a grade of C or better, prior to Semester V. Students should consult with an advisor each semester and must consult with their advisor for program completion of Semesters V, VI, VII and VIII.

The professional semesters of the Early Childhood Program are very important and highly integrated learning experiences. For full consideration students, including transfer students, must register with the Department of Curriculum and Instruction no later than May 1 of the year they plan to begin Semester V of the professional block.

	Semester Credit Hours	
	I	*II*
Semesters I and II		
ENGL 101—Introduction to Writing	3	
MATH 110—Introduction to Mathematics I		3
University Studies Program Requirements		3
SPCH 100—Basic Principles of Speech Communication	3	
PSYC 100—Introduction to Psychology	3	
Social Science or History course from ANTH, GEOG, ECON, GVPT, SOCY or HIST	3	
Biological Science with Lab from BOTN, ZOOL, MICB, or ENTM	4	
MUSC 155—Fundamentals for the Classroom Teacher		3
U S History		3
Total	16	12
Semesters III and IV		
Creative Arts (ARTE 100, PHED 181, DANC 100, or THET 440)	2–3	
MATH 210—Elements of Mathematics	4	
MATH 211—Elements of Geometry		4
Physical Science with Lab from ASTR, GEOL, CHEM, PHYS, OR ENES	4	
Social Science or History course from ANTH, GEOG, ECON, GVPT, SOCY or HIST		3
EDCI 280—School Service Semester		3
University Studies Program Requirements	3	3
Electives	1–2	3
Total	15	16

Junior and Senior Years
(Semesters labeled as V, VI, VII, and VIII in this sample program must be taken as a block)

Semester V	
Professional Semester 1	
(prerequisite to Professional Semester 2)	
EDCI 313—Creative Activities and Materials for Young Children	3
EDCI 314—Introduction to Teaching Reading, Language, Drama	3
EDHD 419A—Human Development and Learning in School	3
MUED 450—Music in Early Childhood Eduction	3
EDCI 318A—Professional Development Seminar	2
EDCI 488—Computers in Early Childhood	1
Total	15
Semester VI	
Professional Semester 2	
(prerequisite to remaining student teaching experiences)	
EDCI 318B—Professional Development Seminar	2
EDCI 315—The Young Child in the Social Environment	3
EDCI 316—The Teaching of Reading in Early Childhood	3
EDCI 317—The Young Child in the Physical Environment	3
EDCI 443A—Children's Literature	3
EDHD 419B—Human Development and Learning in School	3
Total	17
Semester VII	
Professional Semester 3	
EDCI 412—Student Teaching—Kindergarten	4
ENGL 391—Advanced Composition	3
University Studies Program Requirements	6
FMCD 332—The Child and the Family	3
Total	16
Semester VIII	
Professional Semester 4	
EDCI 411—Student Teaching—Preschool	4
EDCI 413—Student Teaching—Primary	8
EDPA 301—Foundations of Education	3
Total	15

Elementary Education. This curriculum is designed for regular undergraduate students who wish to qualify for teaching positions in elementary schools. Students who complete the curriculum will receive the Bachelor of Science degree, and they will meet the Maryland State Department of Education requirements for the Standard Professional Certificate in Elementary Education. The curriculum also meets certification requirements in many other states and the District of Columbia.

The following list of courses is presented as a sample program. While there is some flexibility in the order in which courses may be taken, students must consult regularly with their EDCI advisor to insure that Professional Semester course prerequisites and graduation requirements are fulfilled.

	Semester Credit Hours	
	I	*II*
Semesters I and II		
ENGL 101—Introduction to Writing	3	
MATH 110—Introduction to Mathematics		3
MUSC 155—Fundamentals for the Classroom Teacher	3	
ARTE 100—Fundamentals of Art Education		3
Biological Science with Lab from BOTN, ZOOL, MICB, or ENTM	4	
Physical Science with Lab from ASTR, GEOL, CHEM, PHYS, or ENES		4
Social Science or History course from ANTH, GEOG, ECON, GVPT, SOCY or HIST	3	
University Studies Program Requirements	3	6
Total	16	16
Semesters III & IV		
EDCI 280—School Service Semester*	3	
MATH 210—Elements of Mathematics*	4	
MATH 211—Elements of Geometry		4
ENGL 280, LING 200 or ANTH 371—Introduction to Linguistics		3
PSYC 100—Introduction to Psychology		3
U S History	3	
SPCH 100—Basic Principles of Speech Communication or SPCH 110—Voice and Diction or HESP 202—Fundamentals of Hearing and Speech Science or SPCH 100—Basic Principles of Speech Communication or SPCH 110—Voice and Diction or SPCH 125—Introduction to Interpersonal Communication	3	
Social Science or History course from ANTH, GEOG, ECON, GVPT, SOCY or HIST		3
University Studies Program Requirements	3	1
Total	16	14

* Prerequisite to Professional Semester.

Junior and Senior Years

Semester V	
EDHD 300E—Human Development and Learning*	6
MATH or Science from ASTR, BOTN, CHEM, ENES, ENTM, GEOL, MICB, PHYS, or ZOOL	3
ENGL 391—Advanced Composition	3
Advanced Studies REquirement	3
Total	15

* Prerequisite to Professional Semester

Semester VI	
FMCD 322—The Child and the Family or PSYC 355—Child Psychology	3
EDCI 443—Literature for Children and Young People—Advanced	3
Advanced Studies Requirement	3
EDPA 301—Foundations of Education	3
Elective	3
Total	15

Semester VII
*Professional Semester**

EDCI 322—Curriculum and Instruction in Elementary Education—Social Studies	3
EDCI 342—Curriculum and Instruction in Elementary Education—Language Arts	3
EDCI 352—Curriculum and Instruction in Elementary Education—Mathematics	3
EDCI 362—Curriculum and Instruction in Elementary Education—Reading	3
EDCI 372—Curriculum and Instruction in Elementary Education—Science	3
Total	15

Courses are blocked, i e , one section of students remains together for all five methods courses Students spend two days each week in school classrooms applying concepts and methods presented in methods courses

* These 5 courses must be taken as a block They are not offered separately The Professional Semester is considered a full undergraduate load requiring all of a student's energies Attendance is required for all field activities. Absences will be made up.

Semester VIII

EDCI 481—Student Teaching	12
EDCI 464—Clinical Practices in Reading Diagnosis	3
Total	15

Course Code Prefix—EDCI

Secondary Education . Secondary education is concerned with the preparation of teachers of middle schools, junior high schools, and senior high schools in the following areas. art, English, foreign languages, library science, mathematics, music, science, social studies, and speech and drama

In the areas of art, music, and library science, teachers are prepared to teach in both elementary and secondary schools. Majors in physical education and agriculture are offered in the College of Physical Education, Recreation, and Health and the College of Agriculture in cooperation with the College of Education. Majors in reading are offered only at the graduate level, requiring a bachelor's degree, certification, and at least two years of successful teaching experience as prerequisites.

The Bachelor of Arts degree is offered in the teaching fields of art, English, foreign languages, mathematics, social studies, and speech and drama The Bachelor of Science degree is offered in art, library science, mathematics, music, science, social studies and speech and drama.

Before students can enroll in any of the professional courses in secondary education (EDCI 390, Special Methods and Student Teaching), they must first gain admission to the College of Education's Teacher Preparation Program and arrange for advising with a faculty member in the area of specialization. Admission procedures and criteria are explained in "Admission to Teacher Education" in the section headed College of Education. Students should also note the sequence and prerequisite for the professional teacher education classes:

EDCI 390: prerequisite of, or concurrent enrollment in EDHD 300,

Special Methods. prerequisite of, or concurrent enrollment in EDCI 390,

Student Teaching prerequisite in EDCI 390, special methods courses, and completion of program subject matter requirements.

All students who elect the secondary education curriculum will fulfill the preceding *general* requirements and also prepare to teach one or more school subjects which will involve meeting *specific* requirements in *particular* subject matter fields

The student teaching semester is a full-time commitment and interference with this commitment because of employment is not permitted.

Living arrangements, including transportation for the student teaching assignments, are considered the responsibility of the student.

Foreign Language Requirement—Bachelor of Arts Degree. All students who pursue the Bachelor of Arts degree in secondary education are required to complete two years (12 semester hours) or the equivalent of a foreign language at the college level. If a student has had three years of one foreign language or two years of each of two foreign languages as recorded on his or her high school transcripts, he or she is not required to take any foreign languages in the college, although he or she may elect to do so

If a student is not exempt from the foreign language requirements, he or she must complete courses through the 104 level of a modern language or 204 level of a classical language

In the modern languages—French, German, and Spanish—the student should take the placement test in the language in which he or she has had work if he or she wishes to continue the same language, his or her language instruction would start at the level indicated by the test With classical languages, the student would start at the level indicated in this catalog

For students who come under the provisions above, the placement test may also serve as a proficiency test and may be taken by a student any time (once a semester) to try to fulfill the language requirement.

Students who have studied languages other than French, German, or Spanish, or who have lived for two or more years in a foreign country where a language other than English prevails, shall be placed by the chairperson of the respective language section, if feasible, or by the chairpersons of the foreign language departments Native speakers of a foreign language shall satisfy the foreign language requirements by taking 12 semester hours of English.

Art Education . Students in art education are prepared to teach at any level, K–12.

Visual Arts Education (K–12)

	Semester Credit Hours I	II
Freshman Year		
ENGL 101—Introduction to Writing	3	
MATH 110—Introduction to Mathematics I		3
University Studies Program Requirements	6	3
ARTH 100—Introduction to Art	3	
ARTS 110—Drawing I		3
ARTS 100—Design I	3	
SPCH 100—Basic Principles of Speech Communications or 125 or 220		3
ARTH 260—History of Art I		3
Total	15	15
Sophomore Year		
ARTS 220—Intermediate Drawing		3
University Studies Program Requirements	6	6
ARTH 261—History of Art II	3	
ARTS 320—Painting I		3
EDIT 273—Practicum–Ceramics		3
EDIT 106—Teaching Creative Construction Activities	3	
ARTS 330—Sculpture I	3	
Total	15	15
Junior Year		
EDHD 300—Human Development and Learning	6	
University Studies Program Requirements	3	3
ENGL 391—Advanced Composition		3
ARTS 428—Painting II	3	
EDCI 406—Practicum—Two Dimensional		3
EDCI 390—Principles and Methods of Secondary Education		3
EDCI 480—Child and Curriculum—Elementary	3	
EDPA 301—Foundations of Education		3
Total	15	15
Senior Year		
EDCI 403—Teaching of Art Criticism	3	
Electives	3	
EDCI 400—Seminar in Art Education		3
EDCI 300—Curriculum and Instruction in Art Education	3	
EDCI 402—Student Teaching in Secondary Schools—Art		6
EDCI 407—Practicum—Three Dimensional	3	
ARTS 340—Printmaking I	3	
EDCI 401—Student Teaching in Elementary Schools—Art		6
Total	15	15

English Education . A major in English Education requires 45 semester hours in English and speech. All electives in English must be approved by the student's advisor.

	I	II
Freshman Year		
University Studies Program Requirements	9	6
MATH 110—Introduction to Mathematics	3	
SPCH 100—Basic Principles of Speech Communication or SPCH 125 or 220		3
Foreign Language*	4	4
ENGL 101—Introduction to Writing or ENGL 101H—Honors Composition		3
Total	16	16

* Intermediate mastery of a modern or classical language required

Sophomore Year		
University Studies Program Requirements		3
ENGL 201—World Literature or ENGL 202	3	
ENGL 281—Standard English Grammar, Usage, and Diction	3	
ENGL 310–312—English Literature	6	
ENGL 301—Critical Methods in the Study of Literature or ENGL 453	3	
LING 200—Introductory Linguistics		3
SPCH 230—Argumentation and Debate or SPCH 330, 350 or 356		3
Electives		3
Total	16	16

Junior Year		
University Studies Program Requirements	3	3
ENGL 384—Concepts of Grammar or		
ENGL 385, 482 or 484	3	
ENGL 304—Shakespeare or		
ENGL 403 or 404		3
ENGL 313—American Literature or		
ENGL 430, 431, 432 or 433	3	
EDHD 300S—Human Development and Learning	6	
EDPA 301—Foundations of Education		3
EDCI 390—Principles and Methods of Secondary Education		3
EDCI466—Literature for Adolescents		3
EDCI 467—Teaching Writing	3	
Total	18	15

Senior Year		
ENGL 391—Advanced Composition or		
ENGL 393 or 493	3	
ENGL Electives (Upper Level)	9	
EDCI 447—Field Experience in English Teaching	1	
EDCI 340—Curriculum Instruction and Observation—English Methods	3	
EDCI 463—The Teaching of Reading in the Secondary School		3
EDCI 441—Student Teaching—English		12
EDCI 440—Student Teaching Seminar in Secondary Education. English		1
Total	16	16

Grand Total Credits=127

Foreign Language Education . The Foreign Language Education curriculum is designed for prospective foreign language teachers in secondary schools. The current focus is on Spanish, French and German. Students seeking certification in the areas of Hebrew, Italian, Latin, Portuguese or Russian must apply for certification through a "Credit Count" procedure, rather than a departmental "Approved Program". Further information can be obtained through a *foreign language education* advisor in the Curriculum and Instruction Office.

A minimum of 30 prescribed semester hours in a foreign language plus 9 hours of electives in a related area for a total of 39 hours is required. The student is strongly advised to begin or continue a second foreign language. The foreign language education advisor must approve the 9 hours of "related area" credit. The following requirements must be met within the 30 required hours: one year of advanced conversation, one year of advanced grammar and composition, one year of survey of literature, one year of advanced literature (400 level), one semester of advanced civilization (300 or 400 level), and one semester of applied linguistics. Equivalents to the above must be approved by the appropriate education advisor.

	Semester Credit Hours	
Freshman Year	*I*	*II*
University Studies Program Requirements	3	6
ENGL 101—Introduction to Writing	3	
MATH 110—Introduction to Mathematics	3	
SPCH 100, 125, or 220—Basic Principles of Speech Communication		3
Intermediate Foreign Language (or appropriate level as determined by placement exam)	3	3
Electives*	3	1
Total	15	13
Sophomore Year		
University Studies Program Requirements	6	3
Foreign Language—Grammar and Composition	3	3
Foreign Language—Survey of Literature	3	3
Foreign Language—Advanced Conversation	3	3
Total	15	15
Junior Year		
University Studies Program Requirements	6	
EDHD 300S—Human Development and Learning		6
Foreign Language—Literature (400 level)	3	3
Foreign Language—Civilization	3	
EDCI 390—Principles and Methods of Secondary Education	3	
Electives in Foreign Language, a second foreign language or advanced language course.	3	3
Foreign Language or English Applied Linguistics		3
Total	18	15
Senior Year		
EDPA 301—Foundations of Education	3	
EDCI 430—Seminar in Student Teaching**		3
EDCI 330—Curriculum and Instruction in Secondary Education. Foreign Language***	3	
EDCI 431—Student Teaching in the Secondary Schools***		12
Elective from 400-level courses in foreign language education. See appropriate education area advisor for list of current offerings	3	
ENGL 391—Advanced Composition	3	
Electives*	6	
Total	18	15

* Foreign Language Education majors and Arts and Humanities certification students only are strongly advised to elect courses which lead to a second area of concentration in a foreign language. Foreign language education majors must contact an education advisor in order to plan an integrated program of specialized professional and liberal education. Foreign language majors seeking certification only should be advised by their foreign language advisor.

** Must be taken concurrently with student teaching which occurs during a spring semester only. This course is for foreign language student teachers only.

*** EDCI 330 is offered fall semester only and *must* be taken in senior year preceding enrollment in EDCI 430 and 431, which are offered in spring only.

Library Science Education . All students anticipating work in library science education should consult with advisors in this area at the beginning of the sophomore year. Students enrolled in this curriculum will pursue a Bachelor of Arts degree with an area of concentration of 36 hours in one of the following: Arts and Humanities, Behavioral and Social Sciences, or Mathematics and Science. Students may concentrate in a subject area subsumed under one of these fields, or they may choose a broad spectrum of courses in one of the areas under the guidance of their advisors. The minor of 18 hours will be library science education. Students in library science education will complete fifteen semester hours in directed library experience as their student teaching requirement. The student teaching semester is a full-time commitment to eight weeks each in a secondary and elementary school. A concurrent seminar will also be a part of this experience. Students completing this curriculum will be eligible for certification as an Educational Media Associate, Level I, and will qualify to work in school media centers under the supervision of a Media Generalist, Level II. The following list of requirements is presented as a sample program.

	Semester Credit Hours	
Freshman Year	*I*	*II*
University Studies Program Requirements	6	9
ENGL 101—Introduction to Writing	3	
MATH 110—Introduction to Mathematics	3	
SPCH 100—Basic Principles of Speech Communication or 125 or 220	3	
Area of Concentration		6
Total	15	15
Sophomore Year		
University Studies Program Requirements	6	3
Electives	3	3
Area of Concentration	6	6
LBSC 331—Introduction to Educational Media Services		3
LBSC 381—Basic Reference and Information Sources		3
Total	15	18
Junior Year		
University Studies Program Requirements	3	3
ENGL 391—Advanced Composition		3
EDHD 300—Human Development and Learning	6	
LBSC 382—Cataloging and Classification of Materials		3
LBSC 383—Library Materials for Children and Youth.		3
EDCI 380—Curriculum and Instruction—Elementary		3
EDPA 441—Graphic Materials for Instruction		3
Area of Concentration	6	
Total	15	18
Senior Year		
Area of Concentration	12	
EDPA 301—Foundations of Education	3	
LBSC 384—Media Center Administration and Services	3	
EDCI 483—Student Teaching in School Media Centers—Elementary		6
EDCI 493—Student Teaching in School Media Centers—Secondary		6
EDCI 496—Student Teaching Seminar*		3
Total	18	15

* Must be taken concurrently with student teaching.

Mathematics Education . A major in mathematics education requires the completion of MATH 241 or its equivalent, and a minimum of 15 semester hours of mathematics at the 400 level (excluding MATH 490). 400 level courses beyond those prescribed (402 or 403, 430 or 431) should be selected in consultation with the mathematics education advisor. The mathematics education major must be supported by one of the following science sequences: CHEM 103 and 113, PHYS 221 and 222, or 161 and 262, or 191 and 192, or 141 and 142, BOTN 101 and three additional hours in BOTN courses; ZOOL 101 and three additional hours in ZOOL courses; ASTR 180 and 110 and three additional hours in ASTR (none of which include ASTR 100 or 105). Also a CMSC 110 is required. The following sample program is one way to fulfill requirements.

	Semester Credit Hours I	II
Freshman Year		
SPCH 100—Basic Principles of Speech Communication or 125 or 220	3	
MATH 140, 141—Analysis I, II	4	4
Science Requirement	3–5	3–5
University Studies Program Requirements	3	3
ENGL 101—Introduction to Writing		3
Total	13–15	13–15
Sophomore Year		
MATH 240, 241—Linear Algebra, Analysis III	4	4
University Studies Program Requirements	6	6
CMSC 110—Introductory Computer Programming	3	
Electives	2–4	5–7
Total	15–17	15–17
Junior Year		
ENGL 391—Advanced Composition	3	
MATH 430—Euclidean and Non-Euclidean Geometries	3	
MATH 402—Algebraic Structures or MATH 403—Introduction to Abstract Algebra	3	
EDHD 300S—Human Development and Learning	6	
Mathematics Electives (400 level)		6
University Studies Program Requirements		6
EDCI 390—Principles and Methods of Secondary Education		3
Total	15	15
Senior Year		
Mathematics Electives (400 level)	3	
EDCI 350—Curriculum and Instruction in Secondary Education Mathematics	3	
EDPA 301—Foundations of Education	3	
EDCI 451—Student Teaching in Secondary School Mathematics		12
EDCI 450—Student Teaching Seminar in Mathematics Education		3
Electives	6	
Total	15	15

Music Education . The curriculum in music leads to a Bachelor of Science degree in education with a major in music education. It is planned to meet the demand for specialists, supervisors and resource teachers in music in the schools. The program provides training in the teaching of general music/choral and instrumental music and leads to certification to teach music at both elementary and secondary school levels in Maryland and most other states. There are two options. The general music/choral option is for students whose principal instrument is voice or piano; the instrumental option is for students whose principal instrument is an orchestral or band instrument. Students are able to develop proficiency in both certifications by taking additional courses.

All students teach and are carefully observed in clinical settings by members of the music education faculty. This is intended to insure the maximum development and growth of each student's professional and personal competencies. Each student is assigned to an advisor who guides him or her through the various stages of advancement in the program of music and music education.

Instrumental Option

	Semester Credit Hours I	II
Freshman Year		
MUSP 109, 110—Applied Music (Principal Instrument)	2	2
MUSC 150, 151—Theory of Music	3	3
MUSC 102, 103—Class Piano	2	2
MUSC 116, 117—Study of Instruments	2	2
Speech Requirement	3	
University Studies Program Requirements*	3	6
MUED 197—Pre-Professional Experience		1
MUSC 229—Major Ensemble	1	1
Total	16	17
Sophomore Year		
MUSP 207, 208—Applied Music (Principal Instrument)	2	2
MUSC 250, 251—Advanced Theory of Music	4	4
MUSC 113, 121—Class Study of Instruments	2	2
MUSC 230—History of Music	3	
University Studies Program Requirements	6	3
EDHD 300S—Human Development and Learning		6
MUSC 229—Major Ensemble	1	1
Total	18	18
Junior Year		
MUSP 305, 306—Applied Music (Principal Instrument)	2	2
MUSC 490, 491—Conducting	2	2
MUSC 120, 114—Class Study of Instruments	2	2
MUED 470—General Concepts for Teaching Music	1	
MUED 411—Instrumental Music Elementary	3	
MUED 420—Instrumental Music Secondary		2
University Studies Program Requirements	3	3
MUSC 229—Major Ensemble	1	1
MUED 410—Instrumental Arranging		2
MUED 330, 331—History of Music	3	3
Total	17	17
Senior Year		
MUSP 409—Applied Music (Principal Instrument)	2	
EDCI 484/494—Student Teaching Music		12
EDPA 301—Foundations of Education		3
EDCI 390—Principles and Methods of Secondary Education	3	
University Studies Program Requirements	7	
MUSC 229—Major Ensemble	1	
Total	13	15

* Varies according to incoming placement.

General Music/Choral Option

	Semester Credit Hours I	II
Freshman Year		
MUSP 109, 110—Applied Music (Principal Instrument)	2	2
MUSC 150, 151—Theory of Music	3	3
MUSC 100—Class Voice, MUSC 200—Advanced Class Voice or MUSC 102, 103—Class Piano	2	2
MUED 197—Pre-Professional Experiences		1
Speech Requirement	3	
University Studies Program Requirements*	6	6
MUSC 329—Major Ensemble	1	1
Total	17	15
Sophomore Year		
MUSP 207, 208—Applied Music (Principal Instrument)	2	2
MUSC 230—Music History	3	3
MUSC 202, 203—Advanced Class Piano	2	2
MUSC 250, 251—Advanced Theory of Music	4	4
EDHD 300—Human Development and Learning		6
University Studies Program Requirements	9	
MUSC 329—Major Ensemble	1	1
Total	18	18
Junior Year		
MUSP 405, 409—Applied Music (Principal Instrument)	2	2
MUSC 453—Guitar-Recorder Methods		2
MUED 472—Secondary Choral Methods		2
MUSC 490, 491—Conducting	2	2
MUED 478—Special Topics in Music Education	1	2
MUED 470—General Concepts for Teaching Music	1	
University Studies Program Requirements	3	3
MUSC 329—Major Ensemble	1	1
MUED 471—Elementary General Music Methods	3	
MUSC 330, 331—History of Music	3	3
Total	16	17
Senior Year		
MUSP 410—Applied Music (Principal Instrument)	2	
EDCI 390—Principles and Methods of Secondary Education	3	
EDPA 301—Foundations of Education	3	
EDCI 484/494—Student Teaching Music		12
University Studies Program Requirements	3	3
MUSC 329—Major Ensemble	1	
Total	12	15

* Varies according to incoming placement

Physical Education and Health Education . This curriculum is designed to prepare students for teaching physical education and health in elementary and secondary schools. To obtain full particulars on course requirements, the student should refer to the sections on the Department of Physical Education and the Department of Health Education.

Science Education . A science major consists of a minimum of 60 semester hours study in the academic sciences and mathematics.

The following courses are required for all science education majors: BOTN 101, CHEM 103, CHEM 104 (except chemistry, physics, and earth science education majors who take CHEM 113), GEOL 100–110, PHYS 121–122 or 141–142, ZOOL 101, and six semester hours of mathematics. Science education majors must achieve a minimum grade of C in all required mathematics, science and education coursework.

An area of specialization with a minimum of 33 semester hours, and the approval of the student's advisor, must be completed in biology, chemistry, physics, and geology, as noted below.

Preparation for biology teaching will include: Diversity (either ZOOL 210 or BOTN 202), Human Anatomy and Physiology I (ZOOL 201) or II (ZOOL 202); Plant Physiology (BOTN 441), Field Biology (ZOOL 480, BOTN 212 or ENTM 205), Ecology (ZOOL 212 or BOTN 462-464), Microbiology (MICB 200), Genetics (ZOOL 213 or BOTN 414).

Preparation for chemistry teaching will include: Organic Chemistry (CHEM 233, 243), Quantitative Analysis (CHEM 321), Physical Chemistry (CHEM 481, 482, 483), PHYS 141, 142, MATH 140, 141 and 3 credits of upper division chemistry courses. It is also recommended that the student consider MATH 240, 241 or 246 as part of his/her program. Chemistry electives must be approved by the student's adviser.

Preparation for physics teaching will include: math through MATH 240, or the equivalent. Physics courses will include introductory physics with calculus (PHYS 141, 142), lab courses (PHYS 295, 296), intermediate theoretical physics (PHYS 404, 405 or 406), and modern physics (PHYS 420). There is much flexibility in choosing these courses. In addition, it would be desirable to take coursework in astronomy (ASTR 100, 110, 181, 210 or the 300 series). Participation in PSSC or PP courses (when offered) would be desirable.

Preparation for earth science teaching will include: Historical Geology (GEOL 102, 112), Mineralogy (GEOL 322), Structural Geology (GEOL 341); Geomorphology (GEOL 340); Astronomy (ASTR 100, 110) and 10 credits of earth science electives, of which 7 must be in upper division courses. The earth science electives must be approved by the student's adviser.

Biology Education

	Semester Credit Hours	
Freshman Year	*I*	*II*
ENGL 101—Introduction to Writing	3	
BOTN 101—General Botany	4	
ZOOL 101—General Zoology		4
MATH 110—Introduction to Mathematics I	3	
MATH 111—Introduction to Mathematics II		3
CHEM 103—General Chemistry I	4	
CHEM 104—Fundamentals of Organic and Biochemistry		4
University Studies Program Requirements		3
Total	14	14
Sophomore Year		
ZOOL 201—Human Anatomy and Physiology I OR		
ZOOL 202—Human Anatomy and Physiology II	4	(4)
BOTN 202—The Plant Kingdom OR		
ZOOL 210—Animal Diversity	4	
MICB 200—General Microbiology		4
PHYS 121—Fundamentals of Physics I		4
GEOL 100/110—Introductory Physical Geology and Laboratory	4	
University Studies Program Requirements	2	4
SPCH 100—Basic Principles of Speech Communication or 125 or 220		3
Total	14	15
Junior Year		
ZOOL 213 or BOTN 414—Genetics		4
BOTN 441—Plant Physiology	4	
BOTN 212, BOTN 417, ZOOL 480 or ENTM 205—Field Studies		4
PHYS 122—Fundamentals of Physics II	4	
EDHD 300S—Human Development and Learning	6	
EDPA 301—Foundations of Education		3
University Studies Program Requirements	3	6
Total	17	17
Senior Year		
BOTN 462–464 or ZOOL 212—Ecology	4	
ENGL 391—Advanced Composition or an appropriate substitute	3	
EDCI 489—Field Experience in Education		3
EDCI 390—Principles and Methods of Secondary Education	3	
EDCI 370—Curriculum and Instruction in Secondary Education—Science	3	
EDCI 471—Student Teaching in Secondary Schools—Science		12
University Studies Program Requirements	3	
Total	16	15

Chemistry Education

	Semester Credit Hours	
Freshman Year	*I*	*II*
ENGL 101—Introduction to Writing	3	
BOTN 101—General Botany	4	
ZOOL 101—General Zoology		4
CHEM 103—General Chemistry I	4	
CHEM 113—General Chemistry II		4
MATH 140—Calculus I	4	
MATH 141—Calculus II		4
SPCH 100—Basic Principles of Speech Communication or 125 or 220		3
University Studies Program Requirements		3
Total	15	18
Sophomore Year		
CHEM 233—Organic Chemistry I	4	
CHEM 243—Organic Chemistry II		4
PHYS 141—Principles of Physics	4	
PHYS 142—Principles of Physics		4
GEOL 100—Introductory Physical Geology	3	
GEOL 110—Physical Geology Laboratory	1	
University Studies Program Requirements	3	6
Total	15	14
Junior Year		
CHEM 321—Quantitative Analysis	4	
CHEM 481—Physical Chemistry I	3	
CHEM 482—Physical Chemistry II		3
CHEM 483—Physical Chemistry Laboratory I	2	
ENGL 391—Advanced Composition or an appropriate substitute		3
EDHD 300S—Human Development and Learning		6
Chemistry Elective	3	3
University Studies Program Requirements	3	
Total	15	15
Senior Year		
EDPA 301—Foundations of Education	3	
EDCI 390—Principles and Methods of Secondary Education	3	
EDCI 370—Curriculum and Instruction in Secondary Education—Science	3	
EDCI 471—Student Teaching in Secondary Schools—Science		12
EDCI 489—Field Experience in Education		3
University Studies Program Requirements	6	
Total	15	15

Earth Science Education

	Semester Credit Hours	
Freshman Year	*I*	*II*
ENGL 101—Introduction to Writing	3	
GEOL 100—Introductory Physical Geology	3	
GEOL 110—Physical Geology Laboratory	1	
GEOL 102—Historical Geology		3
GEOL 112—Historical Geology Laboratory		1
BOTN 101—General Botany		4
ZOOL 101—General Zoology	4	
MATH 110 or 140—Introduction to Mathematics I	3	
MATH 111 or 141—Introduction to Mathematics II		3
University Studies Program Requirements		3
SPCH Speech 100, 125 or 220	3	
Total	17	14

Note: MATH 140, 141 are strongly encouraged where student background permits.

Sophomore Year		
GEOL 340—Geomorphology	4	
CHEM 103—General Chemistry I	4	
CHEM 113—General Chemistry II		4
GEOL 322—Mineralogy		4
ASTR 100—Introduction to Astronomy	3	
ASTR 110—Astronomy Laboratory	1	
Earth Science Elective	3	3
University Studies Program Requirements	3	3
Total	18	14
Junior Year		
GEOL 341—Structural Geology	4	
PHYS 121—Fundamentals of Physics I	4	
PHYS 122—Fundamentals of Physics II		4
EDHD 300S—Human Development and Learning		6
ENGL 391—Advanced Composition		3
University Studies Program Requirements	9	3
Total	17	16

Senior Year	
EDCI 390—Principles & Methods of Secondary Education	3
EDCI 370—Curriculum and Instruction in Secondary Education—Science	3
EDPA 301—Foundations of Education	3
EDCI 471—Student Teaching in Secondary Schools—Science	12
EDCI 489—Field Experience in Education	3
Earth Science Electives	4
University Studies Program Requirements	3
Total	16 15

Physics Education

	Semester Credit Hours I	II
Freshman Year		
ENGL 101—Introduction to Writing		3
CHEM 103—General Chemistry I	4	
CHEM 113—General Chemistry II		4
MATH 140—Calculus I	4	
MATH 141—Calculus II		4
PHYS 141—Principal of General Physics I*	4	
PHYS 142—Principal of General Physics II*		4
SPCH 100—Basic Principles of Speech Communication or 125 or 220	3	
Total	15	15

* The physics major sequence (191, 192, 293, 294) or the engineering sequence (161, 162, 263) may be used and appropriate course changes in the remainder of the program will be made

Sophomore Year		
ASTR 111—Observational Astronomy Laboratory		1
PHYS 295—Intro Lab in Electricity and Magneticism	2	
ZOOL 101—General Zoology	4	
BOTN 101—General Botany I		4
PHYS 296—Intro Lab in Electromagnetic Waves		2
ASTR 100—Introduction to Astronomy	3	
MATH 240—Linear Algebra	4	
University Studies Program Requirements	3	9
Total	16	16
Junior Year		
PHYS 404—Intermediate Theoretical Mechanics	3	
PHYS 405—Intermediate Theoretical Electricity and Magnetism		3
PHYS 420—Modern Physics for Engineers		3
PHYS 305—Physics Shop Techniques		1
GEOL 100—Introductory Physical Geology	3	
GEOL 110—Physical Geology Laboratory I	1	
EDHD 300S—Human Development and Learning		6
ENGL 391—Advanced Composition or an appropriate substitute	3	
University Studies Program Requirements	6	3
Total	16	16
Senior Year		
PHYS 406—Optics	3	
PHYS 499—Special Problems in Physics	2	
University Studies Program Requirements	3	
EDPA 301—Foundations of Education	3	
EDCI 390—Principles and Methods of Secondary Education	3	
EDCI 370—Curriculum and Instruction in Secondary Education—Science	3	
EDCI 471—Student Teaching in Secondary Schools—Science		12
EDCI 489—Field Experience in Education		3
Total	17	15

Social Studies Education

Option I (History Concentration). Requires 54 semester hours of which at least 27 must be in history, usually at least six hours in American history selected from HIST 156, 157, 210, 211, 255, 264, 265, 266; six hours of non-American history usually selected from 130–133, 141, 142, 144–145, 234, 235, 237, 281, 285, 290, three hours in Pro-Seminar in Historical Writing—HIST 309, and 12 hours of electives, nine hours must be 300—400 level. Twenty-seven hours of related social sciences as outlined below

At least one course in each of the following areas: sociology (SOCY 100) or anthropology (ANTH 101), two courses in geography (GEOG 100 and GEOG 201 or 202 or 203), in economics (ECON 205 and 310), and government and politics (GVPT 100 and 170). Six hours of upper level social science electives. One of the courses must relate to ethnic and minorities studies and count as part of history and/or social science requirements. For those students with a minor in geography, GEOG 490 is required

	Semester Credit Hours I	II
Freshman Year		
University Studies Program Requirements		6
ENGL 101—Introduction to Writing	3	
MATH 110—Introduction to Mathematics	3	
SPCH 100—Basic Principles of Speech Communication or 125 or 220	3	
HIST 156, 157—History of the United States to 1865, History of the United States since 1865 (or 6 hours of any U S History approved by advisor)	3	3
GEOG 100—Introduction to Geography	3	
GVPT 170—American Government		3
SOCY 100—Introduction to Sociology (or ANTH 101)		3
Total	15	15
Sophomore Year		
HIST 6 hours of any non-U S History approved by advisor	3	3
ECON 310—Evolution of Modern Capitalism in Western Europe and the United States	3	
University Studies Program Requirements	3	3
ECON 205—Fundamentals of Economics		3
GVPT 100—Principles	3	
History Electives	3	3
GEOG 201,202 or 203		3
Total	15	15
Junior Year		
Social Science Elective	3	
History Electives	3	3
EDHD 300S—Human Development and Learning	6	
University Studies Program Requirements	3	6
ENGL 391—Advanced Composition		3
EDCI 390—Principles and Methods of Secondary Education		3
Total	15	15
Senior Year		
EDCI 320—Curriculum and Instruction in Secondary Education—Social Studies*	3	
EDCI 421—Student Teaching in Secondary Schools—Social Studies		12
EDCI 463—The Teaching of Reading in Secondary Schools**	3	
EDCI 420—Student Teaching Seminar in Secondary Education—Social Studies		3
EDPA 301—Foundations of Education	3	
HIST 309—Proseminar in Historical Writing	3	
Social Science Electives	3	1
Elective	3	
Total	18	16

* EDCI 320 will be offered fall semester only and must be taken prior to student teaching

** Evening Course Only

Option II (Geography Concentration). Requires 54 semester hours of which 27 hours must be in geography. GEOG 201, 202, 203, 490 are required. The remaining 12 hours in geography must be upper division systematic courses with one course in regional geography included. Twenty-seven hours of related history and social sciences as outlined below

At least one course in sociology (SOCY 100) or anthropology (ANTH 101), two courses in economics (ECON 205 and 310), in government and politics (GVPT 100 and 170), in history (one in U S history 156 or 157, and one in non-U S history normally 101, 130–133, 144–145). Six hours of upper division history/social science electives. One of the courses must relate to ethnic and minorities studies and can count for one of the required courses. The State of Maryland requires 18 hours of history (six in U S history) to obtain additional certification as a history teacher. Social studies programs offers either a B S or B A. degree.

	Semester Credit Hours I	II
Freshman Year		
University Studies Program Requirements		6
ENGL 101—Introduction to Writing	3	
MATH 110—Introduction to Mathematics	3	
SPCH 100—Basic Principles of Speech Communication or 125 or 220	3	
GEOG 201—Physical Geography	3	
GEOG 202—Cultural Geography		3
U S History (156 or 157)	3	
Non-U S. History (101, 130–133, 144–145)		3
SOCY 100 or ANTH 101		3
Total	15	15

Sophomore Year		
GEOG 203—Economic Geography	3	
GEOG 305—Introduction to Geographic Techniques		3
GEOG Elective	3	3
ECON 205—Fundamentals of Economics	3	
ECON 310—Evolution of Modern Capitalism in W Europe and the United States		3
University Studies Program Requirements	6	3
GVPT 100—Principles of Government and Politics		3
Total	15	15
Junior Year		
ENGL 391—Advanced Composition	3	
GEOG 490—Geography Concepts and Source Material		3
GEOG Elective	3	
University Studies Program Requirements	3	3
EDHD 300S—Human Development and Learning	6	
EDCI 390—Principles and Methods of Secondary Education		3
GEOG Elective		3
GVPT 170—American Government		3
Total	15	15
Senior Year		
EDCI 320—Curriculum and Instruction in Secondary Education—Social Studies*	3	
EDCI 421—Student Teaching in Secondary Education—Social Studies		12
EDCI 420—Student Teaching Seminar in Secondary Education—Social Studies		3
EDCI 463—Teaching Reading in Secondary Schools**	3	
EDPA 301—Foundations of Education	3	
Social Science/History Electives	6	
Electives	4	
Total	19	15

* EDCI 320 will be offered fall semester only and must be taken prior to student teaching.

** Evening Course Only

Option III (Psychology Concentration). Requires 57 semester hours of social sciences of which 24 hours must be in psychology Psychology 100, 200, and one of the following (Psych 400, 410 or 420) are required Psychology 405, 451, and 467 are strongly recommended, ten hours must be at the 400 level. Replication of 300-level courses at the 400 level is not allowed (i e , not both 361 and 461, nor 333 and 433, etc) Independent studies 478 and 479 are also disallowed as credit in the 24 hour requirement.

Twelve semester hours of history are required, of which six semester hours must be United States history

Twenty-one semester hours of related social science courses are required and must include six hours of political science, six hours of geography, six hours of economics, and three hours of either sociology or anthropology One of the courses must be related to ethnic and minorities studies and can count for one of the required courses.

	Semester Credit Hours I	II
Freshman Year		
PSYC 100—Introduction to Psychology	3	
University Studies Program Requirements		6
ENGL 101—Introduction to Writing	3	
MATH 110—Introduction to Mathematics	3	
SPCH 100—Basic Principles of Speech Communication	3	
GEOG 100—Introduction to Geography		3
U S History	3	3
Sociology or Anthropology		3
Total	15	15
Sophomore Year		
PSYC 200—Statistical Methods in Psychology	3	
Psychology Elective		3
Economics	3	3
Government		3
University Studies Program Requirements	6	3
History	3	3
Total	15	15
Junior Year		
PSYC 400 or 410 or 420		4
Psychology Electives	4	
EDHD 300S—Human Development and Learning	6	
EDCI 320—Curriculum and Instruction in Education—Social Studies*		3
EDCI 390—Principles and Methods of Secondary Education		3
University Studies Program Requirements	3	
ENGL 391—Advanced Composition	3	
GEOG 201, 202 or 203		3
Elective		1
Total	16	14
Senior Year		
Psychology Electives		7
EDCI 421—Student Teaching in Secondary Education—Social Studies	12	
EDCI 420—Student Teaching Seminar in Secondary Education—Social Studies	3	
EDCI 463—Teaching of Reading in the Secondary School	3	
EDPA 301—Foundations of Education		3
University Studies Program Requirements		3
Government		3
Total	18	16

* EDCI 320 will be offered fall semester only and must be taken prior to student teaching

Speech and Drama Education . A major in speech and drama education requires 37 semester hours of speech and drama content The program provides for designing a program of study appropriate to prospective teachers in the communication field A 24 hour English minor is to be selected in consultation with the advisor Students desiring a Bachelor of Arts degree must also meet departmental foreign language requirements.

Speech and Drama Education

	Semester Credit Hours I	II
Freshman Year		
ENGL 101—Introduction to Writing	3	
MATH 110—Introduction to Mathematics	3	
SPCH 100—Basic Principles of Speech Communication	3	
DART 110—Introduction to the Theatre	3	
DART 120—Acting		3
SPCH 110—Voice and Diction		3
Elective in Speech and Drama		3
University Studies Program Requirements	3	6
Total	15	15
Sophomore Year		
University Studies Program Requirements	3	3
SPCH 350—Foundations of Communication		3
SPCH 200—Advanced Public Speaking	3	
SPCH 220—Group Discussion		3
Major Area Electives in Speech and Drama		6
Minor Area English suggested	9	
Total	15	15
Junior Year		
ENGL 391—Advanced Composition		3
SPCH 477—Speech Communication and the Study of Language Acquisition	3	
SPCH 489—Speech Communication Workshop		1
EDHD 300S—Human Development and Learning		6
Minor Area English suggested	9	3
University Studies Program Requirements	3	3
Total	15	16
Senior Year		
University Studies Program Requirements		3
HESP 401—Survey of Speech Disorders	3	
EDCI 390—Principles and Methods of Secondary Education	3	
Minor Area English suggested	6	
EDCI 340—Curriculum and Instruction in Secondary Education—Speech*	3	
EDCI 442—Student Teaching in Speech/Drama		12
EDPA 301—Foundations of Education		3
Total	15	18

* Fall only.

Course Code Prefix—EDCI

Education Policy, Planning, and Administration

Professor and Chairman: Warren
Professors: V E Anderson (Emeritus), Andrews, Berdahl, Berman, Carbone, Dudley, Finkelstein, McClure (Emeritus), McLoone, Male, Newell (Emeritus), Stephens, van Zwoll (Emeritus), Wiggin (Emerita)
Associate Professors: Agre, Clague, Goldman, Hopkins, Huden, Lindsay, Noll, Selden, Splaine
Assistant Professors: Coley, Intriligator, King, Schmidtlein, Slater
Affiliate Assistant Professors: Edelstein, Gilmour, Meisinger, Teague

The Department offers undergraduate preparation in the Foundations of Education (EDPA 301) and in Education Communications (EDPA 440). The distributive studies requirement of the University Studies Program includes EDPA 201, Education in Contemporary American Society, and EDPA 210,

Historical and Philosophical Perspectives on Education. The advanced studies requirement of the University Studies Program includes EDPA 488G, Technology, Social Change, and Education. Graduate programs at the master's degree, advanced graduate specialist, and doctoral degree levels include preparation for administrators and policy analysts in education-related agencies, school superintendents, principals, supervisors, human relations specialists, curriculum directors, curriculum-media specialists, and administrative specialists in the areas of finance, school personnel administration, collective bargaining, school law, and higher and adult education. Also offered are graduate programs for the preparation of professors and researchers in the fields of comparative education (the study of educational systems in other regions of the world), curriculum theory; economics and finance of education, education administration, education law; education media, education policy, higher education, history of education; philosophy of education, politics of education, and sociology of education.

Course Code Prefix—EDPA

Human Development (Institute for Child Development)

Professor and Director: Hardy
Professors: Bowie (Emerita), Dittmann (Emerita), Eliot, Goering (Emeritus), Grambs, Hatfield, Kurtz (Emeritus), Morgan (Emeritus), Perkins (Emeritus), Seefeldt, Torney-Purta
Associate Professors: Bennett, Flatter, Gardner, Huebner, Koopman, Marcus, Matteson, Milhollan, Robertson-Tchabo, Rogolsky, Tyler
Assistant Professors: Fox, Green, Holloway, Hunt, Taylor

The Department of Human Development offers: (1) a variety of undergraduate courses in human development at the 300 and 400 levels, including the areas of development, learning and adjustment, (2) graduate programs leading to the M.A., M.Ed. and Ph.D. degrees and the A.G.S. certificate; and (3) field experiences and internships to develop competence in applying theory to educational practice in schools and other settings. Areas of concentration in human development include infancy, early childhood, adolescence, adulthood, and aging. Research in social, physiological, personality and cognitive areas with emphasis on the social aspects of development enhance the instructional program.

Through the Institute for Child Study, the faculty provide consultant services and staff development programs for school systems, parent groups, court systems, mental health agencies and other organizations involved with helping relationships.

Undergraduate courses and workshops are designed for pre-service and in-service teachers as well as those preparing to enter human services vocations. The department does not offer an undergraduate major. However, undergraduate students may elect human development courses in forming an area of concentration such as (1) infancy and early childhood, (2) adolescence, (3) aging, and (4) human services (social service, recreation, corrections, etc.). Major purposes of undergraduate offerings in human development are (1) providing experiences which facilitate the personal growth of the individual, and (2) preparing people for vocations and programs which seek to improve the quality of human life. These offerings are designed to help professionals and paraprofessionals acquire a positive orientation toward people and basic knowledge and skills for helping others.

Course Code Prefix—EDHD

Industrial, Technological and Occupational Education

Professor and Chairman: Maley
Professors: Hornbake (Emeritus), Luetkemeyer
Associate Professors: Anderson, Beatty, Herschbach, Mietus, Peters, Stough
Assistant Professors: Boyce, Elkins, Hultgren, Hunter, Inana, Sullivan
Instructors: Ashley, Aumiller, Chin, Gribbons, Mason, Milligan, Smith, Spear, Strenge

The Department of Industrial, Technological and Occupational Education offers programs leading to teacher certification and degrees in five different fields of teacher preparation. A sixth field of study, industrial technology, is not in teacher preparation. It is designed to prepare individuals for supervisory and management positions in industry, business and government. It also offers a program in industrial technology which prepares individuals for supervisory and industrial management positions in industry, business and government. A technical education program is available for persons with advanced technical preparation who wish to teach in technical institutes or community colleges.

The six curricula administered by the Department include (1) business education, (2) home economics education, (3) industrial arts/technology education, (4) industrial technology, (5) marketing and distributive education, and (6) vocational-technical education. The overall offering includes both undergraduate and graduate programs leading to the degrees of Bachelor of Science, Master of Education, Master of Arts, Doctor of Education, and Doctor of Philosophy. An Advanced Graduate Specialist Program is also available in the teaching fields identified above.

The vocational-technical programs may lead either to certification as a vocational-industrial teacher with no degree involved or to a Bachelor of Science degree, including certification. The University of Maryland is designated as the institution which shall offer the "Trades and Industries" certification courses. Many of the courses offered are those required for certification in Maryland. The vocational-technical curriculum requires trade competence as specified by the Maryland State Plan for Vocational-Industrial Education. A person who aspires to be certified should review the state plan and contact the Maryland State Department of Education. If the person has in mind teaching in a designated school system, he or she may discuss his or her plans with the vocational-industrial education representative of that school system inasmuch as there are variations in employment and certification requirements.

Industrial Arts Education. The industrial arts/technology education curriculum prepares persons to teach industrial arts/technology education at the middle and secondary school level. It is a four-year program leading to a Bachelor of Science degree. While trade or industrial experience contributes significantly to the background of the industrial arts/technology education teacher, previous work experience is not a condition of entrance into this curriculum. Students who are enrolled in the curriculum are encouraged to obtain work in industry during the summer months. Industrial arts/technology education as a middle and secondary school subject area is a part of the general education program characterized by extensive laboratory experiences.

	Semester Credit Hours	
Freshman Year	*I*	*II*
University Studies Program Requirements	3	6
CHEM 102 or 103—Chemistry	4	
EDIT 101—Mechanical Drawing I	2	
EDIT 102—Fundamentals of Woodworking	3	
EDIT 112—Technical Calculations	3	
EDIT 262—Basic Metal Machining		3
EDIT 121—Mechanical Drawing II		2
EDIT 202—Machine Woodworking		3
SPCH 100—Basic Principles of Speech Communication		3
Total	15	17
Sophomore Year		
University Studies Program Requirements	6	3
PHYS 111 or 112—Elements of Physics	3	
EDIT 127—Fundamentals of Electricity-Electronics	3	
EDIT 233—Fundamentals of Power Technology	3	
EDIT 241—Architectural Drawing	2	
EDIT 270—Field Experience		3
ECON 205—Fundamentals of Economics		3
MATH 110—Introduction to Mathematics		3
EDIT 227—Applications of Electronics		3
EDIT 223—Arc and Gas Welding		1
EDIT 210—Foundry		1
Total	17	17
Junior Year		
University Studies Program Requirements	3	3
EDHD 300—Human Development and Learning	6	
EDIT 226—Fundamental Metal-Working Processes	3	
EDIT Elective (Laboratory)	3	
EDIT Elective		2
EDPA 301—Foundations of Education		3
EDIT 311—Lab Practicum in Industrial Arts		3
EDCI 390—Principles and Methods of Secondary Education		3
EDIT 234—Graphic Communications		3
Total	15	17
Senior Year		
EDIT 344—Curriculum, Instruction and Observation	3	
EDIT 422—Student Teaching	12	
EDIT 450—Training Aids Development		3
EDIT 464—Laboratory Organization and Management		3
EDIT Elective		3
EDIT 466—Educational Foundations of Industrial Arts		3
ENGL 391 or 393—Advanced Composition/Technical Writing		3
Total	15	15

Vocational-Technical Education. The vocational-technical curriculum is a four-year program of studies leading to a Bachelor of Science degree in education. It is intended to develop the necessary competencies for the effective performance of the tasks of a vocational or occupational teacher. In addition to establishing the adequacy of the student's skills in a particular trade or technical area and the development of instructional efficiency, the curriculum aims at the professional and cultural development of the individual. Courses are included which would enrich the person's scientific, economic, psychological and sociological understandings. The vocational-certification courses for the State of Maryland are a part of the curriculum requirements.

Persons pursuing this curriculum must present documentary evidence of having an apprenticeship or comparable learning period and journeyman experience. This evidence of background and training is necessary in order

that the trade examination phase of the curriculum may be accomplished if sufficient trade experience is unavailable, such experience must be completed while pursuing the degree.

Persons having completed the necessary certification courses prior to working on the degree program may use such courses toward meeting graduation requirements. However, after certification course requirements have been met, persons continuing studies toward a degree must take courses in line with the curriculum plan and University regulations. For example, junior level courses may not be taken until the student has reached full junior standing.

	Semester Credit Hours I	II
Freshman Year		
University Studies Program Requirements	3	6
ENGL 101—Introduction to Writing	3	
SPCH 100—Basic Principles of Speech Communication	3	
EDIT 112—Technical Calculations	3	
ECON 205—Fundamentals of Economics		3
MATH 110—Introduction to Mathematics or		
MATH 115—Introduction to Analysis		3
Total	12	12
Sophomore Year		
University Studies Program Requirements	6	
Physical Sciences	3	
PSYC 100—Introduction to Psychology	3	
CHEM 103—General Chemistry I		4
EDIT Elective		5
EDIT 270—Field Experience		3
Total	12	12
Trade Examination		20
Junior Year		
University Studies Program Requirements	3	3
EDHD 300—Human Development and Learning	6	
EDIT 462—Occupational Analysis and Course Construction	3	
EDIT 450—Training Aids Development		3
EDIT 465—Modern Industry	3	
EDIT 471—Principles and History of Vocational Education		3
EDIT 457—Tests and Measurements		3
ENGL 391 or 393—Advanced Composition/Technical Writing		3
Total	15	15
Senior Year		
EDIT 350—Methods of Teaching	3	
EDCI 390—Principles and Methods of Secondary Education		3
EDIT 482—Student Teaching*	12	
EDIT 461—Principles of Vocational Guidance		3
EDIT 499—Coordination of Co-op Work Experience		3
EDPA 301—Social Foundations of Education		3
EDIT 464—Laboratory Organization and Management		3
Total	15	15

* **Student Teaching Requirement in Vocational-Technical Education.** Persons currently teaching in the secondary schools with three or more years of satisfactory experience at that level are not required to take EDIT 482. Evidence of satisfactory teaching experience shall be presented in the form of written statements from the principal area supervisor and department head in the school where such teaching is done. Instead of the twelve credits required for student teaching, the individual meeting the above qualifications will have twelve additional semester hours of elective credits.

Elective Credits. Courses in history and philosophy of education, sociology, speech, psychology, economics, business administration and other allied areas may be taken with the permission of the student's advisor.

Elective courses in the technical area (shop and drawing) will be limited to courses and subjects not covered in the trade training experience. Courses dealing with advanced technology and recent improvements in field practices will be acceptable.

Vocational-Industrial Certification. To become certified as a trade industrial and service occupations teacher in the State of Maryland a person must successfully complete 18 credit hours of instruction plus a three credit course in special education or mainstreaming.

The following courses must be included in the 18 credit hours of instruction:

EDIT 350—Methods of Teaching (3)
EDIT 464—Laboratory Organization and Management (3)
EDIT 457—Tests and Measurements (3)
EDIT 462—Occupational Analysis and Course Construction (3)
The remainder of the credit hours shall be met through the election of any two of the following seven courses or completing one of the options:
EECP 411—Mental Hygiene (3)
EDIT 450—Training Aids Development (3)
EDIT 461—Principles of Vocational Guidance (3)
EDIT 465—Modern Industry (3)
EDIT 467—Problems in Occupational Education (3)
EDIT 471—History and Principles of Vocational Education (3)
EDIT 499D—Workshop in Vocational Education (3)
Additional Options are
EDHD 300—Human Growth and Development (6)
or PSYC 100—Introduction to Psychology (3)
and EDHD 360—Educational Psychology (3)

A person in vocational-technical education may use his or her certification courses toward a Bachelor of Science degree. A maximum of 20 semester hours of credit may be earned through examination in the trade in which the student has competence. Prior to taking the examination, the student shall provide documentary evidence of his or her apprenticeship or learning period and journeyman experience. For further information about credit by examination refer to the academic regulations or consult with the department staff.

Industrial Technology. The Industrial Technology curriculum is a four-year program leading to a Bachelor of Science degree. The purpose of the program is to prepare persons for jobs within industry. It embraces four major areas of competence: (a) technical competence, (b) human relations and leadership competence; (c) communications competence; and (d) social and civic competence.

	Semester Credit Hours I	II
Freshman Year		
ENGL 101—Introduction to Writing	3	
PSYC 100—Introduction to Psychology	3	
EDIT 262—Basic Metal Machining	3	
EDIT 101—Mechanical Drawing I	2	
EDIT 112—Technical Calculations or EDIT Elective	3	
University Studies Program Requirements		6
SPCH 107—Technical Speech Communication		3
MATH 110—Introduction to Mathematics I or		
MATH 115—Introductory Analysis		3
EDIT 121—Mechanical Drawing II		2
EDIT 210—Foundry		1
EDIT 223—Arc and Gas Welding		1
Total	14	16
Sophomore Year		
University Studies Program Requirements	6	
MATH 111—Introduction to Mathematics I or		
MATH 220—Elementary Calculus I	3	
PHYS 111—Physics in the Modern World	3	
CHEM 102—Chemistry of Man's Environment or		
CHEM 103—General Chemistry I	4	
ECON 205—Fundamentals of Economics		3
CMSC 103—Intro. to Computing for Non-Majors or		
CMSC 110—Introductory Computer Programming		3/4
PHYS 112—Physics in the Modern World		3
EDIT 127—Fundamentals of Electricity Electronics		3
EDIT 291—Introduction to Plastics Technology		3
Total	16	16
Summer Session		
EDIT 224—Organized and Supervised Work Experience	3	
Junior Year		
ENGL 391/393—Advanced Composition or Technical Writing	3	
PSYC 361—Industrial Psychology	3	
EDIT 443—Industrial Safety Education I	3	
EDIT 465—Modern Industry	3	
EDIT 226—Fundamental Metalworking Processes or		
EDIT 233—Fundamentals of Power Technology or		
EDIT 234—Graphic Communications	3	
University Studies Program Requirements		3
BMGT 360—Personnel Management		3
EDIT 444—Industrial Safety Education II		3
EDIT 425—Analysis of Industrial Training Programs I		3
Areas of Concentration (approved electives)		3
Total	15	15
Summer Session		
EDIT 324—Organized & Supervised Work Experience	3	
Senior Year		
University Studies Program Requirements	3	3
BMGT 362—Labor Relations	3	
BMGT 385—Production Management or App. BMGT Elect.		3
Industrial Technology Elective (Upper Level)	3	3
Area of Concentration (approved electives)	6	6

EDIT 360—Industrial Production Technology or Approved BMGT Elective		3
Total	15	15

Business Education . Two curricula are offered for preparation of teachers of business subjects. The general business education curriculum qualifies for teaching all business subjects except shorthand. Providing thorough training in general business, including economics, this curriculum leads to teaching positions on both junior and senior high school levels.

The secretarial education curriculum is adapted to the needs of those who wish to become teachers of shorthand as well as other business subjects.

General Business Education

	Semester Credit Hours I	II
Freshman Year		
USP Requirements (Distributive) *	7	6
ENGL 101—Introduction to Writing *	3	
MATH 110—Introduction to Math I (USP Fundamental) *	3	
MATH 111—Introduction to Math II (USP Distributive)		3
SPCH 100—Basic Principles of Speech Communication or SPCH 125—Introduction to Interpersonal Communication or SPCH 220—Group Discussion		3
BMGT 110—Introduction to Business and Management		3
EDIT 114—Principles of Typewriting	2	
EDIT 115—Intermediate Typewriting		2
Total	15	17
Sophomore Year		
EDIT 270—Field Experience	3	
BMGT 220, 221—Principles of Accounting I & II	3	3
ECON 201, 203—Principles of Economics I & II (USP Distributive)	3	3
EDIT 214—Office Typewriting Problems		2
Business Electives	3	3
USP Requirements (Distributive) *	3	
EDIT 215—Survey of Office Machines		3
Total	15	14
Junior Year		
EDHD 300S—Human Development and Learning	6	
BMGT 380—Business Law		3
BMGT 301—Introduction to Data Processing	3	
BMGT 302—Information Systems Implementation Techniques		3
BMGT 350—Marketing Principles and Organization	3	
EDIT 406—Word Processing		3
USP Requirements (Advanced) *	3	3
ENGL 391/393—Advanced Composition/Technical Writing *		3
Total	15	15
Senior Year		
EDIT 485—Field Experiences in Business Education	3	
EDIT 301—Foundations of Education	3	
EDIT 340—Methods of Teaching Office Skills **		3
EDIT 341—Curriculum, Instruction and Observation—Business Education ***	3	
EDCI 390—Principles and Methods of Secondary Education	3	
EDIT 432—Student Teaching		12
EDIT 415—Financial and Economic Education I	3	
EDIT 416—Financial and Economic Education II		3
Total	15	18

* USP Requirements

** Spring semester only

*** Fall semester only

Marketing and Distributive Education

	Semester Credit Hours I	II
Freshman Year		
University Studies Program Requirements	6	9
ENGL 101—Introduction to Writing	3	
BMGT 110—Business Enterprise	3	
SPCH 100—Basic Principles of Speech Communication or SPCH 125 or SPCH 220		3
ECON 201—Principles of Economics I	3	
ECON 203—Principles of Economics II		3
Total	15	15
Sophomore Year		
MATH 110—Introduction to Mathematics		3
BMGT 220—Principles of Accounting I	3	
BMGT 221—Principles of Accounting II		3
Business Electives	9	9
University Studies Program Requirements	3	
Total	15	15
Junior Year		
EDHD 300S—Human Development and Learning	6	
BMGT 354—Promotion Management	3	
BMGT 351—Marketing Management	3	
BMGT 360—Personnel Management I	3	
BMGT 353—Retailing		3
BMGT 380—Business Law		3
EDIT 486—Field Experience		3
University Studies Program Requirements	3	6
Total	18	15
Senior Year		
ENGL 391/393—Advanced Composition or Technical Writing	3	
EDPA 301—Foundations of Education	3	
EDIT 414—Organization and Coordination of Distributive Education Programs**		3
BMGT 455—Sales Management	3	
EDIT 343—Curriculum, Instruction and Observation*	3	
EDCI 390—Principles and Methods of Secondary Education	3	
EDIT 452—Student Teaching		12
Business Electives	3	
Total	18	15

* Fall only

** Spring only

Secretarial Education

	Semester Credit Hours I	II
Freshman Year		
USP Requirements (Distributive) *	6	9
ENGL 101—Introduction to Writing *	3	
MATH 110—Introduction to Math I *or* MATH 115—Introduction to Math II	3	
SPCH 100—Basic Principles of Speech Communication or SPCH 125—Introduction to Interpersonal Communication or SPCH 220—Group Discussion		3
EDIT 114—Principles of Typewriting (if exempt, BMGT 110)	2	
EDIT 115—Intermediate Typewriting		2
EDIT 116, 117—Principles of Shorthand I, II	3	3
Total	17	17
Sophomore Year		
EDIT 270—Field Experiences in Education for Business and Industry	3	
Business Elective		3
BMGT 220, 221—Principles of Accounting I & II	3	3
ECON 201, 203—Principles of Economics I & II (USP Distributive) **	3	3
EDIT 214—Office Typewriting Problems	2	
EDIT 215—Survey of Office Machines		3
EDIT 216—Advanced Shorthand and Transcription	3	
USP Requirements (Distributive)		4
Total	14	16
Junior Year		
EDHD 300S—Human Development and Learning	6	
EDIT 304—Administrative Secretarial Procedures***	3	
BMGT 380—Business Law		3
EDIT 406—Word Processing		3
EDIT 405—Business Communications		3
BMGT 301—Introduction to Data Processing	3	
USP Requirements (Advanced)	3	3
ENGL 391/393—Advanced Composition/Technical Writing		3
Total	15	15
Senior Year		
EDPA 301—Foundations of Education	3	
EDIT 485—Field Experiences in Business Education	3	
EDIT 340—Methods of Teaching Office Skills**		3
EDIT 432—Curriculum, Instruction and Observation—Business Education***	3	
EDCI 390—Principles and Methods of Secondary Education	3	
EDIT 432—Student Teaching		12
Business Elective	6	
Total	18	15

* USP Requirements

** Spring semester only

*** Fall semester only

Home Economics Education . The home economics education curriculum is designed for students who are preparing to teach home economics. It includes study of each area of home economics and the supporting disciplines. Twelve hours of the total curriculum include an area of concentration which must be unified in content and which will be chosen by the student.*

	Semester Credit Hours	
Freshman Year	*I*	*II*
CHEM 103—General Chemistry I	4	
SPCH 100—Basic Principles of Speech Communications or SPCH 107—Technical Speech Communication or SPCH 125—Introduction to Interpersonal Communication	3	
TEXT 150—Introduction to Textile Materials	3	
NUTR 100—Elements of Nutrition	3	
PSYC 100—Introduction to Psychology	3	
APDS 101B—Fundamentals of Design or ARTE 100—Introduction to Art Education		3
SOCY 100—Introduction to Sociology		3
University Studies Program Requirements		3
ENGL 101—Introduction to Writing		3
MATH 110—Introduction to Mathematics		3
Total	16	15
Sophomore Year		
BIOL 101—Organization and Interrelationship in the Biological World	3	
FMCD 250—Decision-Making in Family Living	3	
HSAD 240—Design and Furnishings in the Home or HSAD 251—Family Housing	3	
FMCD 332—The Child in the Family or EDHD 411—Child Growth and Development	3	
EDIT 207—Bases for Curriculum Decisions in Home Economics	3	
ECON 205—Fundamentals of Economics		3
FOOD 210—Scientific Principles of Food Preparation and Management		4
University Studies Program Requirements		6
TEXT 221—Apparel or TEXT 222—Apparel II		3
Total	15	16
Junior Year		
EDHD 300—Human Development and Learning	6	
FMCD 330—Family Patterns		3
FMCD 341—Personal and Family Finance or FMCD 443 Consumer Problems or		
FMCD 280—Families and Communities in the Ecosystem	3	
EDIT 435—Curriculum Development in Home Economics	3	
EDIT 436—Field Experience in Analysis of Child Development Lab	3	
University Studies Program Requirements		3
FMCD 260—Interpersonal Life Styles or SOCY 443—The Family and Society		3
Area of Concentration *		6
ENGL 391/393—Advanced Composition/Technical Writing	3	
Total	18	15
Senior Year		
FMCD 344—Resident Experience in Home Management (offered fall only) or FMCD 343—Applied Home Management (offered spring only)	3	
EDPA 301—Foundations of Education	3	
Area of Concentration *	6	
University Studies Program Requirements	3	
EDCI 390—Principles and Methods of Secondary Education		3
EDIT 342—Curriculum, Instruction, and Observation—Home Economics		3
EDIT 442—Student Teaching in Secondary Schools—Home Economics		12
Total	15	18

* Area of Concentration: 12 semester hours.

The Area of Concentration is a block of 12 semester hours credit intended to give the student expertise in some special facet of home economics. This block of courses is chosen by the student and approved by the advisor.

Course Code Prefix—EDIT

Measurement, Statistics and Evaluation

Professor and Chairman: Lissitz
Professors: Dayton, Stunkard
Associate Professors: Johnson, Macready, Schafer
Assistant Professor: Benson
Affiliate Appointment: Sedlacek

For Advanced Undergraduates and Graduates. The Department of Measurement, Statistics and Evaluation offers programs at the master's and doctoral level for persons with quantitative interests from a variety of social science and professional backgrounds. In addition, a doctoral minor is offered for students majoring in other areas. The doctoral major is intended primarily to produce individuals qualified to teach courses at the college level in applied measurement, statistics and evaluation, generate original research and serve as specialists in measurement, applied statistics or evaluation in school systems, industry or government. The masters level program is designed to provide individuals with a broad range of data management, analysis and computer skills necessary to serve as research associates in academia, government and business. At the doctoral level, a student may choose a specialty within one of three areas: applied or theoretical measurement, applied statistics, and program evaluation.

Course Code Prefix—EDMS

Special Education

Professor and Chairman: Burke
Professors: Hebeler, Simms
Associate Professors: Egel, Kohl, Seidman
Assistant Professors: Beckman, Cooper, Graham, Harris, Leifer, Leone, Speece
Research Associates: Adger, Coulson, Haynes, MacArthur, Maloul, Noel, Ogle, Pilato, Spence, Zlatlow
Instructors: Aiello, Amaia, Zantal-Weiner
Faculty Research Assistants: Andrews, Davis, Dreifuss, Green, McCargo, Noble, Skarvold, Stettner-Eaton, Wizer

The Special Education Department offers an innovative and rigorous undergraduate program which prepares teachers of handicapped infants, children or young adults. This program has been nationally recognized for many of its exemplary features. It is a five-year (10 semester) professional certification program which graduates students with a Bachelor of Science degree in special education with full special education teacher certification in the State of Maryland and certification reciprocity in over forty other states. Students enter the program as pre-special education majors and enroll in courses which meet University and College requirements. At the same time, students take supporting coursework designed to provide an understanding of normal human development and basic psychological and sociological principles of human behavior.

Prior to formal acceptance as a special education major, all students are required to enroll in a special education introductory course (EDSP 210) which provides a survey of the history and current issues in special education. Upon successful completion of the introductory course and 30 semester hours of requirements, pre-special education majors apply for formal admission to the Department of Special Education by submitting an application with a statement of intent specifying their professional goals.

In Semester V and VI students accepted as Special Education majors take a two-semester sequence of generic special education courses and practicum experiences. These courses provide the student with a solid foundation in theory and practice related to the education of all handicapped children across a wide range of ages and disabilities.

At the completion of Semester V, students select one of the following four areas of specialization:

1. Education of the Severely Handicapped (SH)
2. Early Childhood Special Education (EC)
3. Education of the Educationally Handicapped (EH)
4. Career/Vocational Education of the Handicapped (C/V)

Coursework in each of these four areas is designed to develop expertise with a specific handicapped population. Students work directly with handicapped children or youth during each semester, leading up to student teaching during the last semester.

Objectives. Special Education students receive specialized training in the following areas: language development; motor development, social-emotional development, normal human behavior; social and educational needs of the handicapped, diagnostic and educational assessment procedures; instructional procedures and materials; curriculum development, classroom and behavior management; effective communication with the parents and families of handicapped children, community resource planning; and local, state and federal laws concerning handicapped children and youth. Graduates of the program are expected to master specific skills in each of these areas.

Entrance Requirements. Acceptance to the major in special education is on a competitive basis during the sophomore year, except for a small number of academically talented freshmen. A minimum grade point average of 2.5 is required for consideration for admission to the department. Specific requirements are defined under the specialized admissions section, below.

Combined Bachelor's Master's Program. Selected undergraduate students majoring in special education will be eligible for dual application of credit to both the bachelor's and master's degrees. A student desiring graduate credit should apply for admission to the Graduate School during the last semester of the fourth year. If admitted to the Graduate School, the student may select up to 12 credits (four courses) of specified coursework from the fifth year of the undergraduate program to be applied simultaneously toward the credits required for the master's degree in special education at The University of Maryland. The selected courses may not include field practica or student teaching experiences. Students will be expected to fulfill supplemental requirements in the selected courses. To complete the master's degree, students must fulfill all Graduate School requirements for the degree, with the exception of the selected 400-level courses.

Academic Advisement. The Department of Special Education provides academic advisement through a faculty and a peer advisement program. Special education majors are assigned a faculty advisor, who is carefully matched to the student's area of interest. It is required that all students receive advisement on a semester basis. Students are urged to use the Special Education Advisory Center, Room 1235 in the Benjamin Building.

Student Organizations. The Department of Special Education encourages student participation in extra-curricular activities within and outside of the University.

Council for Exceptional Children. The Department of Special Education sponsors Chapter 504 of the Council for Exceptional Children (CEC). The goals of the chapter include both professional development of the members and service to the University and community. Activities include meetings on topics relevant to special education, trips to state and national conventions, and student/faculty social events.

Student Advisory Board. The department Student Advisory Board is made up of two undergraduate special education students, two graduate special education students, and one representative from CEC. These members are elected by the student body. The purpose of the board is to represent the student body at departmental faculty meetings and to offer student opinions on matters of concern.

Volunteer and Career Services. This service, coordinated by students, compiles and disseminates information regarding volunteer and part-time job opportunities for working with handicapped students.

General Information. Specific inquiries concerning the undergraduate program in Special Education may be directed to the Department at (301) 454-2118. All applications are processed through the UMCP Office of Undergraduate Admissions.

Specialized Admission Requirements. With the exception of academically talented students, all students declaring special education as a major will be accepted as pre-special education majors. Consideration for admittance as a full special education major requires the following:

1. Completion of at least 30 semester credits of coursework including the following courses: EDSP 210, PSYC 100, SOCY 100 or 105, STAT 100, EDHD 411 and 460, MATH 110 and 210, HESP 202 and 400, and the required U.S. history, English literature and a laboratory science course. EDSP 210 should be completed with a grade of C or better.
2. A minimum of a 2.5 grade point average. Admission is competitive beyond the minimum required for consideration.
3. Submission of an application together with a statement of intent specifying the applicant's professional goals.

Admittance will be based on the completion of the required courses, the grade point average, the applicant's experience with handicapped persons, and the appropriateness and clarity of the professional goal statement.

An appeals process has been established for students who do not meet the competitive GPA for admission, but who are applying in connection with special University programs including affirmative action and academic promise.

Admission to the Department usually occurs during the sophomore year. Students then take general special education coursework during the third year and choose a specialty area sequence at that time. Students are accepted into one of their top two specialty area choices.

	Semester Credit Hours	
Freshman Year	*I*	*II*
ENGL 101—English Composition	3	
ENGL Literature*		3
HIST United States*		3
MATH 110—Introduction to Mathematics		3
PSYC 100—Introduction to Psychology*	3	
SOCY 100—Introduction to Sociology*		
OR		
SOCY 105—Introduction to Contemporary Social Problems*	3	
Science with Lab*	4	
HESP 202—Fundamentals of Hearing and Speech Sciences		3
University Studies Program Requirements	3	3
Total	16	15
Sophomore Year		
EDSP 210—Introduction to Special Education	3	
STAT 100—Introduction to Statistics*	3	
EDHD 411—Child Growth and Development		
OR		
PSYC 355—Child Psychology	3	
MATH 210—Elements of Mathematics *		4
EDHD 300—Human Development and Learning		6
HESP 400—Speech and Language Development	3	
EDHD 460—Educational Psychology		3
Electives	3	3
Total	15	16

* Satisfies both University Studies Program and supporting area of content requirements

Junior Year		
EDSP 320—Introduction to Assessment in Special Education	3	
EDSP 321—Comparative Approaches to Behavior and Classroom Management in Special Education	3	
EDSP 322—Field Placement in Special Education I	3	
EDSP 330—Families and the Education of Handicapped Children		3
EDSP 331—Introduction to Curriculum and Instructional Methods in Special Education		3
EDSP 332—Interdisciplinary Communication in Special Education		3
EDSP 333—Field Placement in Special Education II		3
ENGL 391—English Composition	3	
EDPA 301—Foundations of Education		3
Advanced USP Requirement	3	
Total	15	15

The Severely Handicapped Option

Senior Year		
EDSP 400—Curriculum and Instructional Methods for Severely Handicapped Students	3	
EDSP 402—Field Placement Severely Handicapped I	5	
EDSP 403—Physical and Communication Development for Severely Handicapped Students		3
EDSP 404—Education of Autistic Children	3	
EDSP 405—Field Placement Severely Handicapped II		5
EDSP 410—Community Functions for Severely Handicapped Students		3
Advanced USP Requirements	3	
Elective	2	
EDSP 443—Assessment and Instructional Design for the Handicapped Reading and Written Communication Disorders		3
Total	16	14
Fifth Year		
EDSP 420—Developmental and Behavioral Characteristics of Nonhandicapped and Handicapped Infants and Young Children or		
EDSP 460—Career/Vocational Education for the Handicapped	3	
EDSP 411—Field Placement Severely Handicapped III	5	
EDSP 412—Vocational Instruction for Severely Handicapped Students	3	
EDSP 417—Student Teaching Severely Handicapped		11
EDSP 418—Seminar Special Issues and Research Implications in the Instruction of Severely Handicapped Students		3
Elective	3	
Total	14	14

The Educationally Handicapped Option

Senior Year		
EDSP 440—Assessment and Instructional Design for Educationally Handicapped Cognitive and Psychosocial Development		3
EDSP 441—Assessment and Instructional Design for the Handicapped Oral Language and Communication Disorders	3	
EDSP 442—Field Placement Educationally Handicapped I	3	
EDSP 443—Assessment and Instructional Design for the Educationally Handicapped Reading and Written Communication Disorders		3
EDSP 445—Field Placement Educationally Handicapped II		4
EDHD 413—Adolescent Development		3
EDCI 456—Diagnosis and Treatment of Learning Disabilities in Mathematics	3	
University Studies Program Requirements	3	
Elective	3	
Total	15	13
Fifth Year		
EDSP 446—Instructional Design for the Educationally Handicapped Functional Living Skills	3	
EDSP 447—Field Placement Educationally Handicapped III	4	
EDSP 450—Program Management for the Educationally Handicapped	3	
EDSP 457—Student Teaching Educationally Handicapped		11
EDSP 458—Seminar Special Issues in Research Related to the Educationally Handicapped		3
EDCP 410—Introduction to Counseling and Personnel Services	3	
Elective	3	
Total	16	14

The Career Vocational Education of the Handicapped Option

Senior Year		
EDSP 443—Assessment and Instructional Design for the Handicapped: Reading and Written Communication Disorders		3
EDSP 460—Career/Vocational Education for the Handicapped	3	
EDSP 461—Field Placement: Career/Vocational I	3	
EDSP 462—Career/Vocational Assessment and Instruction for the Mild to Moderately Handicapped I		3
EDSP 463—Field Placement: Career/Vocational II		3
EDIT 421—Industrial Arts in Special Education	3	
EDCI 456—Diagnosis and Treatment of Learning Disabilities in Mathematics		3
University Studies Program Requirements	3	
Elective	3	2
Total	15	14
Fifth Year		
EDSP 450—Program Management for the Educationally Handicapped		11
EDSP 465—Field Placement: Career/Vocational III	3	
EDSP 467—Student Teaching: Career/Vocational		11
EDSP 468—Special Topics Seminar in Career/Vocational Education for the Handicapped		3
EDCP 410—Introduction to Counseling and Personnel Services	3	
Elective	3	
EDSP 446—Instructional Design for the Educationally Handicapped: Functional Living Skills		3
Total	12	17

The Early Childhood Special Education Option

Senior Year		
EDSP 420—Developmental and Behavioral Characteristics of Non-Handicapped and Handicapped Infants and Young Children	3	
EDSP 421—Field Placement: Early Childhood Special Education I	3	
EDSP 422—Curriculum and Instruction in Early Childhood Special Education (Moderate to Mild: 3–8 yrs)		3
EDSP 424—Field Placement: Early Childhood Special Education		4
EDCI 410—The Child and Curriculum—Early Childhood	3	
EDCI 416—Mainstreaming in Early Childhood Educational Settings		3
University Studies Program Requirements	3	
Elective	3	
EDSP 443—Assessment and Instructional Design for the Handicapped: Reading and Written Communication Disorders		3
Total	15	13
Fifth Year		
EDSP 423—Psychoeducational Assessment of Preschool Handicapped Children	3	
EDSP 430—Intervention Techniques and Strategies for Preschool Handicapped Children (Severe to Moderate: Birth to Six Years)	3	
EDSP 431—Field Placement: Early Childhood Special Education (Severe to Moderate)	4	
EDSP 437—Student Teaching: Early Childhood Special Education		11
EDSP 438—Seminar: Special Issues in Early Childhood Education		3
Elective	3	
EDSP 400—Curriculum and Instructional Methods for Severely Handicapped Students or		
EDSP 441—Assessment and Instructional Design for the Educationally Handicapped—Oral Language and Communication Disorders		3
Total	13	17

Course Code Prefix—EDSP

College of Human Ecology

Dean: Beaton

The College of Human Ecology is an interdisciplinary professional school focused upon issues arising from the interrelationships and interactions between people and their environment. Human ecology develops, integrates and applies knowledge and methodologies in the natural and behavioral sciences, the arts and the humanities to the identification, analysis and solution of societal problems.

The College of Human Ecology shares in the obligation of all higher education to provide a broad-based education for undergraduates and graduate students. The College provides a balance of professional education as well as experiences which benefit the individual personally as a functioning and contributing member of society.

Opportunities are provided through laboratory, practical and field experiences for making knowledge and innovative discovery more meaningful to the individual. Through these experiences the faculty experiments with varying relevant techniques and methods by which the individual can transfer to the society-at-large new ideas and methods for more effective interaction within the social and physical ecosystems in which we function.

Fields of study leading to a major in the College of Human Ecology are organized into four departments: Family and Community Development (FMCD), Food, Nutrition and Institution Administration (FNIA), Housing and Design (HSAD), and Textiles and Consumer Economics (TXCE).

Objectives

1. Offer appropriate comprehensive bachelor, master and doctoral programs that address both a broad based education and technical expertise in the selected program area.
2. Maximize resources and resource utilization in order to accomplish comprehensive professional programs.
3. Act as a resource to the University community to stimulate awareness and interest in the problems of applying knowledge for improving the quality of life.

Special Facilities and Activities. The College of Human Ecology building follows the campus tradition in style, and a construction program has been completed to provide expanded facilities, with modern, well-equipped laboratories and classrooms.

Student Organizations

AATCC–Student Chapter. The University of Maryland Chapter of the American Association of Textile Chemists and Colorists provides students with an early opportunity to become associated with the national professional organization of AATCC and to advance at the local level the aims and goals of the parent national organization. Student members develop contacts with professionals and fellow students at AATCC meetings. These contacts help to orient the student to the job market and to new developments in the field. Students in textile science and in textile marketing should be interested in AATCC.

ASID–Student Chapter. The University of Maryland Student Chapter of the American Society of Interior Designers is associated with the professional chapter of ASID in Washington D.C. Student members have the opportunity for contacts with professional and fellow students at meetings sponsored by both groups. These can help to orient the student to the job market and to new directions in the profession.

Collegiate Home Economics Organization. The University of Maryland Collegiate Home Economics Organization is the student affiliate of the American Home Economics Association. Welcoming any human ecology major into its membership, the organization meets once a month, and links the professional world to the college student through different programs.

The Collegiate Home Economics Organization is the student's opportunity to join a professional group prior to graduation and to participate on a student level in the national association.

Elegant–Student Chapter. The University of Maryland student chapter of Elegant provides students interested in apparel design, fashion merchandising and textile marketing an opportunity to develop contacts with professionals and fellow students at Elegant meetings. These contacts help to orient the student to the job market and to new developments in the field.

Graphix. The University of Maryland Student Chapter of Industrial Graphics International (I.G.I.) provides students with opportunities to meet, and benefit from, professionals in the field. These contacts help insure continued updating of professional standards and exposure to diverse ideas.

MCIC–Student Chapter. The University of Maryland Student Chapter of the Maryland Consumer Interest Council gives students an opportunity to understand the operational side of consumer protection by interacting with state and local figures in consumer education, consumer protection and consumer legislation. While composed primarily of students majoring in consumer economics, it also includes consumer oriented students from other departments, schools and divisions on the campus.

Omicron Nu. A national honor society whose objectives are to recognize superior scholarship, to promote leadership and to stimulate an appreciation for graduate study and research in the field of home economics and related areas. Graduate students, seniors and second semester juniors are eligible for election to membership.

Financial Aid. A Loan Fund, composed of contributions by the District of Columbia Home Economics Association, Maryland Chapter of Omicron Nu, and personal gifts, is available through the Office of Student Financial Aid

Admission. All students desiring to enroll in the College of Human Ecology must apply to the Director of Admissions of The University of Maryland College Park

Degrees. The degree of Bachelor of Science is conferred for the satisfactory completion, with an average of C or better, of a prescribed curriculum of 120 academic semester hour credits No grade below C is acceptable in the departmental courses which are required for a departmental major.

Student Load. The student load in the College of Human Ecology varies from 12–18 credits per semester A student wishing to carry more than 18 credits must have a B grade average and permission of the dean.

A minimum of 120 academic credits is required for graduation. However, for certification in some professional organizations, additional credits are required Consult your advisor.

General Information. Specific inquiries concerning undergraduate or graduate programs in the College of Human Ecology may be directed to the chairman of the appropriate department or the Dean, College of Human Ecology, The University of Maryland, College Park, Maryland 20742.

Curricula. A student may elect one of the following curricula, or a combination of curricula experimental foods, community nutrition, dietetics, nutrition research, or institution administration (food service); family sciences, advertising design, interior design, apparel design, textile marketing, fashion merchandising, textile science, or consumer economics

All students in the College of Human Ecology, in addition to meeting the University Studies Requirements, are required to complete a series or sequence of courses to satisfy College and departmental requirements. The remaining courses needed to complete a program of study are elected by the student with the approval of his advisor

The final responsibility of meeting all the requirements for a specific major rests with each individual student.

College of Human Ecology Requirements
(for every student depending on the major)

	Semester Credit Hours
Human Ecology Electives *	9
SOCY 100 or ANTH 102	3
PSYC 100	3
ECON 205—Fundamentals of Economics or ECON 201—Principles of Economics	3
SPCH 100, 107, or 125	3

* Human Ecology Elective to be taken in the College in departments other than major department.

College of Human Ecology Departments, Programs and Curricula

Family and Community Development

Associate Professor and Acting Chairperson: Rubin
Professors: Gaylin, Hanna
Associate Professors: Hula, Myricks, Wilson
Assistant Professors: Anderson, Churaman, Epstein, Leslie, Valadez
Lecturer: Wernimich

The Department of Family and Community Development is devoted to describing, explaining, and improving the quality of life by means of research, education, community outreach and public service The approach is holistic, emphasizing human ecology The curriculum places special emphasis upon the family and the community as mediating structures in determining life quality The jobs for which the curriculum is designed include counseling, program management, research, advocacy, and service delivery

Graduates of the Department obtain positions in human service agencies, consulting firms, voluntary organizations, and federal, state, and local governments Their specific jobs may be in areas, agencies or organizations such as the Federal Drug Administration, Planned Parenthood, youth services, family services, or senior citizens programs

There are three interrelated majors offered by the Department

I. Family Studies. This course of study stresses a working knowledge of the growth of individuals throughout the life span with particular emphasis on intergenerational aspects of family living It examines the pluralistic family forms and life styles within our post-technological complex society and the development of the individual within the family within the community

II. Management and Consumer Studies. Within this major are two specializations (a) program management and (b) consumer affairs The focus is upon the efficient and effective utilization of organizational and other community resources

III. Community Studies. This major stresses community development, community organization and advocacy and their relevance to families. In general there is an emphasis upon the processes and methods for social change, as well as the individuals, organizations or groups which act as agents of change

Each of these courses of study includes a set of major subject courses offered primarily within the Department plus a sequence of supporting area courses which may be taken outside the Department or in an interdepartmental combination. Examples of supporting areas include the aging, the disabled, business management, health, housing, public administration, rehabilitation, and urban affairs Students are strongly encouraged to consult with an appropriate advisor in developing their course of study

There are parallel requirements for each of the department's three majors (family studies, management and consumer studies, and community studies). Each major requires a 15-credit set of core courses (a department-wide core of 12 credits and a major-specific 3-credit course), an additional 15 credits drawn from a list of major-relevant departmental courses, and an 18-credit thematic set of supportive area courses To graduate, students must also meet the requirements of the campus (e.g., those specified in the University Studies Program) and of the College of Human Ecology Students should consult the current *Undergraduate Catalog* and departmental Majors Guide and also see an appropriate departmental advisor. The major requirements are as follows

Family Studies— (a) 15-credit required core FMCD 200, 202, 250, 330, 348, 349, (b) courses from which an additional 15 credits of the major's requirements must be selected FMCD 105, 260, 332, 350, 370, 381, 430, 431, 432, 441, 447, 450, 460, 485, 487, 497, and special topics courses approved for this major, (c) 18 credits in a supportive area constituting a common focus or theme, e.g., aging and the aged, disabilities and the disabled, or sociology

Management and Consumer Studies— (a) 15-credit required core FMCD 200, 202, 250, 348, 349, 444, (b) courses from which an additional 15 credits of the major's requirements must be selected FMCD 280, 341, 350, 381, 443, 445, 447, 452, 453, 483, 484, and special topics courses—usually concerning organizational management—approved for this major, (c) 18 credits in a supportive area constituting a common focus or theme, e.g., personnel and labor relations, or public administration.

Community Studies— (a) 15-credit required core FMCD 200, 201, 202, 250, 348, 349, (b) courses from which an additional 15 credits of the major's requirements must be selected FMCD 280, 381, 442, 444, 447, 450, 452, 453, 483, 484 and special topics courses—usually concerning housing—approved for this major; (c) 18 credits in a supportive area constituting a common focus or theme, e.g., community psychology, international development, or urban studies.

Food, Nutrition and Institution Administration

Professor and Chairman: Read
Professors: Ahrens, Beaton, Prather
Associate Professors: Axelson, Moser, Williams
Assistant Professors: Choi, Noble, Richardson, Taylor
Instructors: McDonald (p.t.), Shipley-Moses (p.t.)
Lecturer: Norton
Adjunct Professors: Bodwell, Hamosh, Kelsay, Reiser, Trout
Adjunct Associate Professors: Goldberg, Reynolds
Adjunct Assistant Professors: Behall, Halfrisch, James, Michaelis, Monagan, Rinke
Adjunct Lecturers: Blyler, Gehlhausen, Gong, Hartwick, Hosteller
Affiliate Assistant Professor: McKenna

The area of food, nutrition and institution administration is broad and offers many diverse professional opportunities Courses introduce the student to the principles of selection, preparation and utilization of food for human health and the welfare of society Emphasis is placed on the scientific, cultural and professional aspects of this broad area of food and nutrition The department offers five areas of emphasis experimental foods, community nutrition nutrition research, dietetics, and institution administration Each program provides for competencies in several areas of work, however, each option is designed specifically for certain professional careers

All areas of emphasis have in common several courses within the department and the University the curricula are identical in the freshman year

Experimental foods is designed to develop competency in the scientific principles of food and their reactions Physical and biological sciences in relation to foods are emphasized The program is planned for students who are interested in product development, quality control and technical research in foods The *nutrition research* program is designed to develop competency in the area of nutrition for students who wish to emphasize physical and biological sciences The *community nutrition* program emphasizes applied community nutrition this program is approved by the American Dietetic Association *dietetics* develops an understanding and competency in food, nutrition and management as related to problems of dietary departments the curriculum is approved by the American Dietetic Association *institution administration* emphasis is related to the administration of quantity foodservice in university and college residence halls and student unions, school lunch

programs in elementary and secondary schools, restaurants, hospitals, nursing homes, coffee shops, and industrial cafeterias. This program is approved by the American Dietetic Association.

Grades: All students are required to earn a C grade or better in all courses applied toward satisfaction of the major. This includes all required courses with prefix of FOOD, NUTR, and IADM as well as certain required courses in supporting fields. A list of these courses for each program may be obtained from the Department Office.

Dietetics Emphasis

	Semester Credit Hours I	II
Freshman Year		
CHEM 103—General Chemistry	4	
CHEM 104—Fundamentals of Organic and Biochemistry		4
ZOOL 101—General Zoology		4
NUTR 100—Elements of Nutrition	3	
MATH 110—Introduction to Mathematics I or 115—Pre-calculus	3	
ENGL 101—Introductory Writing	3	
FOOD 105—Professional Orientation	1	
FOOD 240—Science of Food I		3
SOCY 100—Introduction to Sociology or ANTH 102—Introduction to Anthropology-Cultural		3
Total	14	14
Sophomore Year		
MICB 200—General Microbiology	4	
FOOD 250—Science of Food II	3	
PSYC 100—Introduction to Psychology	3	
ZOOL 201, 202—Anatomy and Physiology	4	4
ECON 205—Fundamentals of Economics		3
BCHM 261—Introductory Biochemistry		3
SPCH 100—Basic Principles of Speech Communications or SPCH 107—Technical Speech Communication		3
Human Ecology Elective		3
Total	14	16
Junior Year		
NUTR 300—Science of Nutrition	4	
IADM 300—Food Service Organization and Management	3	
University Studies Program Requirements	3	3
Human Ecology Elective	3	3
NUTR 450—Advanced Human Nutrition		3
Elective	3	
ENGL 391 or 393—Advanced Composition or Technical Writing		3
University Studies Program Requirements		3
Total	16	15
Senior Year		
NUTR 460—Therapeutic Human Nutrition	3	
University Studies Program Requirements	6	3
IADM 350—Foodservice Operations I		4
IADM 440—Food Service Personnel Administration		2
EDHD 460—Educational Psychology	3	
Electives	3	4
Data Processing or Statistics Course[1]		3
Total	15	16

Experimental Foods Emphasis

	Semester Credit Hours I	II
Freshman Year		
MATH 110—Introductory Mathematics or 115—Pre-Calculus	3	
NUTR 100—Elements of Nutrition		3
ENGL 101—Introductory Writing	3	
CHEM 103, 113—General Chemistry I, II	4	4
MATH 220—Elementary Calculus		3
PHYS 121—Fundamentals of Physics		4
FOOD 105—Professional Orientation	1	
PSYC 100—Introduction to Psychology	3	
Total	14	14
Sophomore Year		
SOCY 100—Introduction to Sociology or ANTH 102—Introduction to Anthropology-Cultural	3	
CHEM 233, 243—Organic Chemistry I, II	4	4
FOOD 240, 250—Science of Food I, II	3	3
ECON 205—Fundamentals of Economics		3
ZOOL 101—General Zoology or BOTN 101—General Botany	4	
BCHM 261—Elements of Biochemistry		3
Human Ecology Elective	3	3
Total	17	16
Junior Year		
University Studies Program Requirements	6	3
FDSC 412 or 413—Principles of Food Processing I, II	3	
MICB 200—General Microbiology	4	
BIOM 301 or 401—Introduction to Biometrics or Biostatistics I	3	
FDSC 430—Food Microbiology		2
FDSC 434—Food Microbiology Lab		2
ENAG 314—Mechanics of Food Processing		4
ENGL 393—Technical Writing		3
Total	16	14
Senior Year		
FOOD 440, 450—Advanced Food Science I, II	3	3
FOOD 445—Advanced Food Science Lab	1	
SPCH 107 or 100—Technical Speech Communications or Basic Principles of Speech Communications	3	
FDSC 422—Food Product Research and Development		3
Electives		4
University Studies Program Requirements	3	6
Human Ecology Elective	3	
Total	13	16

Institution Administration Emphasis

	Semester Credit Hours I	II
Freshman Year		
MATH 110 or 115—Introduction to Mathematics I or Pre-Calculus	3	
University Studies Program Requirements		3
SPCH 100 or 107—Basic Principles of Speech Communications or Techniques of Speech Communication		3
FOOD 105—Professional Orientation	1	
ENGL 101—Introductory Writing	3	
ZOOL 101—General Zoology	4	
CHEM 103—General Chemistry I	4	
CHEM 104—Fundamentals of Organic and Biochemistry		4
PSYC 100—Introduction to Psychology		3
SOCY 100 or ANTH 102—Introduction to Sociology or Introduction to Anthropology—Cultural		3
Total	15	16
Sophomore Year		
MICB 200—General Microbiology	4	
FOOD 240, 250—Science of Food I, II	3	3
University Studies Program Requirements	6	3
ZOOL 202—Human Physiology and Anatomy II		4
NUTR 200—Nutrition for Health Services		3
ECON 205—Fundamentals of Economics		3
IADM 200—Introduction to Food Service	2	
Total	15	16
Junior Year		
IADM 300—Food Service Organization and Management	3	
Human Ecology Elective		3
Electives	4	5
IAMD 350, 355—Food Service Operations I, II	4	4
ENGL 391 or 393—Advanced Composition or Technical Writing	3	
BMGT 362 or ECON 370—Labor Relations or Labor Economics		3
Total	14	15
Senior Year		
University Studies Program Requirements	3	3
IADM 450—Food Service Equipment and Planning	3	
EDHD 460—Educational Psychology	3	
IADM 490 or 480—Special Problems or Practicum		3
IADM 455—Manpower Planning in Food Service	3	
Data Processing or Statistics[1]		3
IADM 440—Food Service Personnel Administration		2
Human Ecology Elective	3	3
Total	15	14

Community Nutrition Emphasis

	Semester Credit Hours I	II
Freshman Year		
University Studies Program Requirements		3
ZOOL 101—General Zoology	4	
MATH 110—Introduction to Mathematics I or 115—Pre-Calculus	3	
NUTR 100—Elements of Nutrition	3	
CHEM 103—General Chemistry I	4	
FOOD 105—Professional Orientation	1	
ENGL 101—Introductory Writing		3

CHEM 104—Fundamentals of Organic and Biochemistry or CHEM 233—Organic Chemistry I		4
PSYC 100—Introductory Psychology		3
FOOD 240—Science of Food I		3
Total	15	16
Sophomore Year		
SPCH 100—Basic Principles of Speech Communication or 107—Techniques of Speech Communication		3
MICB 200—General Microbiology	4	
SOCY 100 or ANTH 102—Introduction to Sociology or Cultural Anthropology	3	
FOOD 250—Science of Food II	3	
ZOOL 213—Genetics and Development	4	
ZOOL 211—Cell Biology and Physiology		4
University Studies Program Requirements		6
BCHM 261—Introductory Biochemistry		3
Total	14	16
Junior Year		
NUTR 300—Science of Nutrition	4	
IADM 300—Food Service Organization and Management	3	
EDHD 460—Educational Psychology		3
ENGL 391 or 393—Advanced Composition or Technical Writing		3
NUTR 450—Advanced Nutrition		3
Human Ecology Elective	3	3
University Studies Program Requirements		3
ECON 205—Fundamentals of Economics	3	
Elective	2	
Total	15	15
Senior Year		
BIOM 301—Introduction to Biometrics or EDMS 451—Introduction to Educational Statistics	3	
IADM 340—Food Service in the Community	4	
NUTR 460—Therapeutic Human Nutrition	3	
NUTR 470—Community Nutrition	3	
NUTR 475—Dynamics of Community Nutrition		3
ZOOL 422—Vertebrate Physiology		4
University Studies Program Requirements		6
Human Ecology Electives		3
Total	13	16

Nutrition Research Emphasis

	Semester Credit Hours I	II
Freshman Year		
University Studies Program Requirements		3
MATH 110—Introduction to Mathematics I or 115—Pre-Calculus	3	
NUTR 100—Elements of Nutrition	3	
FOOD 105—Professional Orientation	1	
SPCH 100 or 107—Basic Principles of Speech Communication or Technical Speech Communication		3
SOCY 100—Introduction to Sociology or ANTH 102—Introduction to Anthropology-Cultural		3
ENGL 101—Introductory Writing	3	
CHEM 103—General Chemistry I	4	
CHEM 113—General Chemistry II		4
Human Ecology Elective		3
Total	14	16
Sophomore Year		
CHEM 233—Organic Chemistry I	4	
PSYC 100—Introduction to Psychology	3	
FOOD 240, 250—Science of Food I, II	3	3
ZOOL 211—Cell Biology and Physiology	4	
ZOOL 213—Genetics and Development		4
BCHM 261—Elements of Biochemistry		3
MICB 200—General Microbiology		4
Total	14	14
Junior Year		
University Studies Program Requirements	3	6
Human Ecology Elective	3	
CHEM 243—Organic Chemistry II	4	
ECON 205—Fundamentals of Economics	3	
ENGL 391 or 393—Advanced Composition or Technical Writing		3
ZOOL 422—Vertebrate Physiology		4
NUTR 300—Science of Nutrition	4	
NUTR 450—Advanced Human Nutrition		3
Total	17	16
Senior Year		
BCHM 461, 462—Biochemistry I, II	3	3
BCHM 463, 464—Biochemistry Lab I, II	2	2
BIOM 301 or 401—Introduction to Biometrics or Biostatistics I	3	
NUTR 490—Special Problems in Nutrition	3	
University Studies Program Requirements		6
Electives	4	
Human Ecology Elective		3
Total	15	14

[1] Select from this list: BIOM 301, 401, BMGT 301, CMSC 103, 110, EDMS 451.

Housing and Design

Professor and Chair: Francescato
Professors: Bonta, Kjaer
Associate Professor: McWhinnie
Assistant Professors: Ansell, Chen, Gips, Roper, Thomas, Thorp
Instructors: Dean, Odland
Lecturers: Bulger (p.t.), Davis (p.t.), Elliott (p.t.), Heid (p.t.), Hoover (p.t.), Lee, Schurter (p.t.)

The Department of Housing and Design offers programs of concentration in three areas: housing, interior design, and advertising design.

The Department seeks to provide professionally focused instruction in the theoretical foundation, methods, and skills pertinent to each concentration area. In addition, students are encouraged to acquire a broad base of general education by enrolling in elective, recommended, and required courses outside of the Department.

Housing. The housing curriculum is designed to reflect the multidisciplinary nature of the field as well as the varied interests of housing majors. Consequently, students under the close supervision and advisement of the faculty are given the opportunity to develop a program suitable to their interests and career goals. Aside from the required housing courses provided by the department, students are recommended to take courses which will emphasize the development of methodological skills (e.g. statistics, computer programming), as well as an understanding of the political, social and economic environment in which housing is produced and consumed. Graduates will be qualified for employment in the housing industry, governmental housing agencies, housing authorities, and consumer organizations. They will also be qualified to pursue a program of graduate studies in housing or urban affairs.

Interior Design. This program provides the student with fundamental concepts and basic professional skills required to plan and design interior environments. These include not only aesthetic considerations, but also the integration of structural and mechanical building systems, the satisfaction of functional requirements, an understanding of the needs and motivations of the users and sponsors, considerations of cost, and compliance with codes and regulations. Functional and imaginative applications of design skills to space planning and furnishing of commercial, institutional, and residential interiors are stressed. Special courses include considerations of barrier-free design for handicapped and elderly users, gaming simulation in design, and seminars in theoretical concerns. A student chapter of the professional organization ASID and internship opportunities provide contact with practicing professionals. Graduates will be qualified for entry level employment with interior design firms and architectural firms. Students with above average performance will be qualified to pursue graduate study. After considerable experience has been gained in professional practice, some graduates will open their own firm or partnership.

Advertising Design. This program provides a foundation in the fields of graphic and visual communication. Although some of the media used in visual communication are the same as those of the painter and the sculptor, the purposes and methods of the designer differ from those of the artist in that utility is the focus of this endeavor. Visual elements such as lines, planes, volume, texture, and color are used to generate information and to communicate messages. This process requires the acquisition of specific professional skills such as page composition, type selection, illustration, photography, design of orientation systems, and the use of complex technology in contemporary printing and electronic media. Students graduating from this program will be qualified to begin a career as graphic designers and seek employment in publishing firms, advertising agencies, the film and television industry, the print media, the packaging industry, and in the graphic section of institutions and government agencies. Students with above average performance will be qualified to pursue graduate study. A student chapter of the professional organization IGI and internship opportunities provide contacts with practicing professionals.

Admission to the Pre-Design Major. Any student who has been admitted to the University may declare a pre-design major. However, admission to the University or to the pre-design major does not guarantee admission to the interior design or advertising design major. Admission to these two majors is governed by the "Selective Admission" procedure outlined below.

Admission to the Interior Design and Advertising Design Majors

1 Admission to the majors of interior design and advertising design is selective. Ordinarily, students are admitted to these majors only after a Design Work Portfolio, produced according to minimum requirements set forth below, has been reviewed and found satisfactory by the Faculty Admission Committee composed of the three Area Coordinators and the Department Chairperson. The portfolio must be submitted by the appropriate deadline. Students will need a minimum of 29 credit hours, including APDS 101, APDS 102, APDS 103, and EDIT 160, before their portfolios are reviewed.

2 The following categories of students are exempted from the portfolio review requirement:
   (a) Freshmen having a 3.0 high school GPA *and* combined SAT score of 1200 or above, or who are National Merit and National Achievement Scholarship finalists or semifinalists, or recipients of the Chancellor's Scholarship, or of Maryland Distinguished Scholar Award, or Benjamin Banneker Scholarship.
   (b) Students with a minimum of 29 credit hours and a grade of B or higher in the following courses: APDS 101, APDS 102, APDS 103, and EDIT 160.

3 Transfer students must submit their Design Work Portfolio at the time of their application for admission to The University of Maryland or later, but in any case by the appropriate deadline. These students will be admitted to the majors of interior design or advertising design after the portfolio has been reviewed and found satisfactory. Transfer students who have not completed 29 credits, or who have not completed the four required courses, or whose Design Work Portfolios have been found unsatisfactory may be admitted as "pre-design" students.

4 Potentially talented students who are unable to meet the above criteria may be admitted *provided* they have applied as a "case-by-case" student and have been accepted by the Faculty Admission Committee composed of the three Area Coordinators and the Department Chairperson. Examples of non-academic criteria on the basis of which the Committee may grant admission are: samples of the applicant's design work done in high school or community college, participation in portfolio preparation summer courses, leadership in extracurricular or community activities, hobby skills related to interior design and/or advertising design, job related experience in the design field, Armed Forces experience in design areas, etc.

5 Students not yet admitted to the majors of interior design and advertising design are classified as "pre-design" students. Pre-design students will be granted preferential treatment when registering for departmental courses in which there is an enrollment limitation.

6 A course in "Preparation of Design Portfolio" is offered in Summer Session I for all students in the pre-design category who have successfully completed 29 credit hours including APDS 101A, APDS 102, APDS 103, and EDIT 160 or who are transfer students with an equivalent level of preparation but who have not satisfactorily passed the portfolio review. Passing this course, however, is not equivalent to satisfactory completion of the portfolio review.

7 Admission to the interior design or advertising design majors is not automatic, even when all relevant requirements have been fulfilled. It is the student's responsibility to file a "Change of Major" form with the Department by the appropriate deadline prior to the beginning of the semester in which the student plans to take 200-level-and-above courses restricted to majors only. No exceptions will be made to this procedure. Students will be informed by mail of action taken.

8 *Deadlines:*
Admission application (filing "Change of Major" form) and portfolio submission must *be received* by
   (a) For fall semester—May 23, 1986
   (August 15 for students enolled in "Preparation of Design Portfolio" or in Summer School)
   (b) For spring semester—January 6, 1987

Advertising Design Curriculum
(Advertising design courses must be taken in sequence.)

Typical Freshman Year	*Semester Credit Hours*
APDS 101A—Fundamentals of Design	3
ARTS 110—Drawing I	3
Speech Course	3
ENGL 101—Introduction to Writing	3
MATH 110 or 115—Introduction to Mathematics or Pre-Calculus	3
APDS 102—Design II	3
EDIT 160—Design Illustrating I	2
APDS 103—Design III	3
Human Ecology Core	6
SOCY 100 or ANTH 102	3
Total	32
Typical Sophomore Year	
APDS 210—Presentation Techniques	3
PSYC 100—Introduction to Psychology	3
University Studies Program Requirement	9
Human Ecology Core	3
APDS 237—Photography	3
APDS 211—Action Drawing	3
HSAD 340—Period Homes and Their Furnishings OR	
HSAD 341—Contemporary Development	3
EDIT 234—Graphic Communications	3
Total	30
Typical Junior Year	
University Studies Program Requirement	6
ENGL 391 or 393—Advanced Composition or Technical Writing	3
ECON 205—Fundamentals of Economics	3
APDS 320—Fashion Illustration	3
APDS 330—Typography and Lettering	3
ARTH 450—20th Century Art or Other Upper Level Art History	3
APDS 331—Advertising Layout	3
APDS 332—Display Design	3
HSAD 362—Ideas in Design OR	
Allied Area Course	3
Total	30
Typical Senior Year	
APDS 430—Advanced Problems in Advertising Design	3
APDS 337—Advanced Photography	3
Allied Area Courses	6
Elective	5
APDS 380—Professional Seminar	2
APDS 431—Advanced Problems in Advertising Design	3
University Studies Program Requirement	6
Total	28

Interior Design Curriculum
(Interior design courses must be taken in sequence.)

Typical Freshman Year	*Semester Credit Hours*
APDS 101A—Fundamentals of Design	3
ENGL 101—Introduction to Writing	3
EDIT 160—Design Illustrating I	2
Speech Course	3
MATH 110 or 115—Introduction to Mathematics or Pre-Calculus	3
PHYS 106—Light, Perception, Photography and Visual Phenomena	3
SOCY 100 or ANTH 102	3
APDS 102—Design II	3
Human Ecology Elective (TEXT 150)	3
APDS 103—Design III	3
Total	29
Typical Sophomore Year	
APDS 210—Presentation Techniques	3
PHYS 107—Laboratory (may be taken in freshman year concurrently with PHYS 106)	1
HSAD 246—Materials of Interior Design	3
University Studies Program Requirement	11
ECON 205—Fundamentals of Economics	3
PSYC 100—Introduction to Psychology	3
Supporting-Block Courses	6
Total	30
Typical Junior Year	
Human Ecology Elective (TEXT 463)	3
HSAD 340—Period Homes and their Furnishings	3
HSAD 342—Space Development	3
ENGL 391 or 393—Advanced Composition or Technical Writing	3
Supporting-Block Course	3
HSAD 341—Contemporary Development	3
HSAD 343—Interior Design I	3
Elective	6
HSAD 362—Ideas in Design OR	
ARTH Elective (300 or 400 level)	3
Total	30
Typical Senior Year	
HSAD 344—Interior Design II	3
Elective	11–12
Supporting-Block Course	3
University Studies Program Requirement	3
HSAD 345—Professional Aspects of Interior Design OR	3
HSAD 380—Professional Seminar	2
HSAD 440—Interior Design III	4

HSAD 441—Interior Design IV	4
Total	31

Course Code Prefixes—APDS, HSAD

Textiles and Consumer Economics

Professor and Chairman: Smith
Professors: Dardis, Hollies, Spivak, Yeh
Associate Professors: Block, Brannigan, Chern
Assistant Professors: Ettenson, Hacklander, Paoletti, Pourdeyhimi, Wagner, Wilbur (Emeritus)
Instructors: Anderson (p.t.), Mihelcic (p.t.)
Lecturers: Feinberg (p.t.), Fise (p.t.), Goldberg (p.t.), Morris (p.t.), Powell, Jr. (p.t.), Stone (p.t.)

Students in Textiles and Consumer Economics may select one of four majors. Each major offers diverse professional opportunities. In addition to the requirements of the major, students have the flexibility to take a concentration of courses in an area closely related to their major such as business, economics, family services, journalism, sciences, art and art history, or speech and dramatic art by carefully utilizing their free electives and University Studies Program requirements. Students are encouraged to work closely with their faculty advisor.

In the *textile* major, emphasis is placed on the scientific and technological aspects of textiles. Two options are open to men and women in this program, textile science or consumer textiles. Graduates in textile science are prepared for textile industry positions in research and testing laboratories, in consumer technical service and marketing programs, in quality control, and in buying and product evaluation. Graduates in consumer textiles are prepared for careers in product development and consumer relations programs in business and industry, in consumer information and education programs in the public and private sector and in government regulatory agencies concerned with textile products.

The *textile marketing/fashion merchandising* major emphasizes the marketing of textile products. Students completing this program are prepared for careers with manufacturing, wholesale and retail organizations in buying, merchandising, fashion coordination, publicity, styling, personnel, sales or marketing. Two options are open to students in this program, textile marketing or fashion merchandising. Graduates completing the textile marketing option will be prepared to enter every level of textile marketing at the manufacturing, wholesale and retail levels. Graduates in fashion merchandising will be prepared for careers in retailing with department or specialty stores. A special internship in retailing is available for students in the textile marketing/fashion merchandising program.

The *apparel design* major offers qualified students the opportunity to prepare for positions as designers, assistant designers, stylists, fashion executives, fashion coordinators, consultants to the home sewing industry, or extension and consumer education programs.

The *consumer economics* major combines economics and marketing with a knowledge of basic consumer goods and services. The program focuses on consumer decision-making and the degree to which the market place reflects consumer needs and preferences. The subject matter includes consumption economics, marketing, consumer behavior, consumer law, and consumer technology. Graduates completing the consumer economics major may work in the planning, marketing and consumer relations divisions of business and industry, in program development and analysis for government agencies providing consumer protection services or in extension and consumer education programs.

An internship program is available to all students majoring in the Department of Textiles and Consumer Economics during their senior year. Students must apply for admission to the internship program including the retailing internship in the second semester of their junior year.

A department honors program permits outstanding undergraduates to explore on an individual basis a program of work which will strengthen their undergraduate program and their professional interests. Students selected for the program must have at least a "B" average to be considered. Students in the honors program participate in a junior honors seminar and present a senior thesis. Students completing this program graduate with departmental honors.

Apparel Design

	Semester Credit Hours I	II
Freshman Year		
ENGL 101 Introduction to Writing, if not exempt	3	
TEXT 105—Textiles in Contemporary Living	3	
MATH 110 or 115—Introduction to Mathematics I or Pre-Calculus	3	
SOCY 100—Introduction to Sociology	3	
SPCH 100, 107 or 125—Basic Principles of Speech Communication, Technical Speech Communication or Introduction to Interpersonal Speech Communication		3
Human Ecology Elective (APDS 101—Fundamentals of Design)		3
TEXT 150—Introduction to Textile Materials		3
CHEM 103, 102 or 111—General Chemistry I, Chemistry of Man's Environment or Chemistry in Modern Life	3–4	
CHEM 104—Fundamentals of Organic and Biochemistry or Department Elective*		3–4
PSYC 100—Introduction to Psychology		3
Total	15–16	15–16
Sophomore Year		
University Studies Program Requirements	6	6
ECON 201—Principles of Economics I	3	
ECON 203—Principles of Economics II		3
TEXT 221—Apparel I	3	
TEXT 222—Apparel II		3
TEXT 250—Textile Materials: Evaluation & Characterization	3	
Human Ecology Elective (APDS 102—Design II)		3
Total	15	15
Junior Year		
TEXT 347—History of Costume II		3
TEXT 355—Textile Furnishings		3
BMGT 350—Marketing Principles and Organization		3
TEXT 365—Fashion Merchandising		3
TEXT 420—Apparel Design: Draping		3
Department Elective*		3
Human Ecology Elective (APDS 211)		3
Electives		6
ENGL 391 or 393—Advanced Composition or Technical Writing		3
Total		30
Senior Year		
TEXT 441—Clothing and Human Behavior		3
TEXT 375—Economics of Textile and Apparel Industries		3
TEXT 425—Apparel Design: Advanced Problems		3
Department Elective*		3
University Studies Program Requirements		6
Electives		10–12
Total		28–30

* Department Electives: Select from TEXT 345, 363, 365, 388, 470 or 498.

Textile Marketing/Fashion Merchandising

Students in the *textile marketing/fashion merchandising* program must complete the common requirements of the program. In addition, they must select either the textile marketing or the fashion merchandising option and complete the courses specified for the option selected. Textile marketing option: CHEM 103, CHEM 104, TEXT 400 and TEXT 452. Fashion merchandising option: CHEM 103, CHEM 104, TEXT 221, TEXT 222 or BMGT 220, and TEXT 365.

	Semester Credit Hours I	II
Freshman Year		
ENGL 101—Introduction to Writing, if not exempt	3	
TEXT 105—Textiles in Contemporary Living	3	
MATH 110 or 115—Introduction to Mathematics I or Pre-Calculus	3	
SOCY 100—Introduction to Sociology	3	
SPCH 100, 107 or 125—Basic Principles of Speech Communication, Technical Speech Communication or Introduction to Interpersonal Speech Communication		3
Human Ecology Elective (APDS 101 Fundamentals of Design)		3
TEXT 150—Introduction to Textiles		3
PSYC 100—Introduction to Psychology		3
CHEM 103—General Chemistry I	4	
CHEM 104—Fundamentals of Organic and Biochemistry		4
Total	16	16
Sophomore Year		
University Studies Program Requirements	6	6
ECON 201—Principles of Economics I	3	
ECON 203—Principles of Economics II		3
TEXT 250—Evaluation & Characterization of Textile Materials		3
Human Ecology Elective	3	
TEXT 221—Apparel I or Department Elective* (See Option Selected)	3	
TEXT 222—Apparel II or BMGT 220 Accounting I or Department Elective* (See Option Selected)		3
Total	15	15
Junior Year		
Electives		9
BMGT 350—Marketing Principles and Organization		3
TEXT 355—Textile Furnishings		3
TEXT 400—Research Methods or Department Elective* (See Option Selected)		3
Human Ecology Elective		3
TEXT 365—Fashion Merchandising or Elective (See Option Selected)		3
BMGT Requirement*		3

ENGL 391 or 393—Advanced Composition or Technical Writing	3
Total	30
Senior Year	
TEXT 441—Clothing and Human Behavior or CNEC 437—Consumer Behavior	3
TEXT 375—Economics of the Textile and Apparel Industries	3
University Studies Program Requirements	6
TEXT—452 Textile Science Chemical Structure and Properties of Fibers or Department Elective* (See Option Selected)	3
BMGT Requirement**	3
Electives	10
Total	28

* Department Electives Select from CNEC 310, 410, 431 433, 435, 437, 455, 456, 457, or TEXT 347, 363, 388 441, 470, 498

** BMGT Requirement Select from BMGT 220, 221, 301, 353, 354, 360, 364 454 455 or 456

Textiles

Students in the *textile* program must complete the common requirements of the program. In addition, they must select either the textile science or the consumer textile option and complete the courses specified for the option selected. Textile science option: CHEM 113, CHEM 233, CHEM 243, PHYS 141–142 or 121–122 and MATH 140–141. Consumer textile option: TEXT 355, CNEC 431, CNEC 437, CNEC 455 and BMGT 350.

	Semester Credit Hours I	II
Freshman Year		
ENGL 101—Introduction to Writing, if not exempt	3	
TEXT 105—Textiles in Contemporary Living	3	
MATH 110 or 115—Introduction to Mathematics I or Pre-Calculus	3	
SOCY 100—Introduction to Sociology		3
SPCH 110, 107, or 125—Basic Principles of Speech Communication, Technical Speech Communication or Introduction to Interpersonal Speech Communication		3
Human Ecology Elective		3
TEXT 150—Introduction to Textile Materials		3
CHEM 103—General Chemistry I	4	
CHEM 104 or 113—Fundamentals of Organic and Biochemistry or General Chemistry II (See Option Selected)		4
PSYC 100—Introduction to Psychology	3	
Total	16	16
Sophomore Year		
University Studies Program Requirements	3	6
Elective (Consumer Textile Option)	3	
TEXT 250—Textile Materials Evaluation and Characterization	3	
CHEM 233, 243—Organic Chemistry I, II or Electives (See Option Selected)	3–4	3–4
MATH 140—Calculus I or Elective (See Option Selected)	3–4	
MATH 141—Calculus II or Elective (See Option Selected)		3–4
TEXT 355—Textile Furnishings (Consumer Textile Option)		3
Total	14–15	14–15
Junior Year		
ECON 201 and 203—Principles of Economics I and II		6
PHYS 141 or 121—Principles of Physics or Fundamentals of Physics I or CNEC 431—The Consumer and the Law (See Option Selected)		3–4
PHYS 142 or 122—Principles of Physics or Fundamentals of Physics II or CNEC 437—Consumer Behavior (See Option Selected)		3–4
CNEC 455—Product Standards or Elective (See Option Selected)		3
TEXT 452—Textile Science Chemical Structure and Properties of Fibers		3
Human Ecology Elective		6
University Studies Program Requirements		3
Elective (Consumer Textile Option)		3
Total		29–30
Senior Year		
ENGL 391 or 393—Advanced Composition or Technical Writing*		3
BMGT 350—Marketing Principles and Organization or Elective (See Option Selected)		3
TEXT 454—Textile Science Finishes or TEXT 456—Textile Science Dyes and Dye Application		3
TEXT 375—Economics of the Textile and Apparel Industries		3
TEXT 400—Research Methods		3
CNEC 435—Economics of Consumption or Elective (See Option Selected)		3
University Studies Program Requirements		6
Electives		4–7
Total		28–31

* ENGL 393 preferred

Consumer Economics

	Semester Credit Hours I	II
Freshman Year		
ENGL 101—Introduction to Writing, if not exempt	3	
MATH 110 or 115—Introduction to Mathematics I or Pre-Calculus		3
SOCY 100—Introduction to Sociology	3	
SPCH 100, 107 or 125—Basic Principles of Speech Communication, Technical Speech Communication or Introduction to Interpersonal Speech Communication		3
Human Ecology Elective		3
CNEC 100—Introduction to Consumer Economics	3	
University Studies Program Requirements	3	3
PSYC 100—Introduction to Psychology		3
Elective	3	
Total	15	15
Sophomore Year		
University Studies Program Requirements	6	3
ECON 201 and 203—Principles of Economics I and II	3	3
MATH 220 or 140—Elementary Calculus I or Calculus I	3–4	
MATH 221 or 141—Elementary Calculus II or Calculus II or Elective		3–4
Elective		3
Human Ecology Elective	3	3
Total	15–16	15–16
Junior Year		
CNEC 435—Economics of Consumption		3
CNEC 310—Consumer Economics and Public Policy		3
ENGL 391 or 393—Advanced Composition or Technical Writing		3
Consumer Product Information *		3
Consumer Product Information *		3
BMGT 350—Marketing Principles and Organization		3
ECON 401—National Income Analysis		3
ECON 403—Intermediate Price Theory		3
Elective		6
Total		30
Senior Year		
CNEC 400—Research Methods		3
CNEC 437—Consumer Behavior		3
CNEC 431—The Consumer and the Law		3
University Studies Program Requirements		6
CNEC 410—Consumer Finance		3
Consumer Product Information *		3
Electives		7–9
Total		28–30

* Consumer Product Information: Select from CNEC 455, 456, 457; TEXT 150, 250, 355, 452, 454 FOOD 110, 300, NUTR 100, HSAD 251, 460 and other courses subject to approval by Department.

Course Code Prefixes—TEXT, CNEC

College of Library and Information Services

Dean: Walston

The College of Library and Information Services is a graduate program which draws its students from many undergraduate disciplines. Although many of the College of Library and Information Services students have degrees in the social sciences and humanities, there is an increasing interest in people with diverse backgrounds—in the sciences, for example. The continued influence of scientific advances, the variations in clientele and service patterns, and the constantly shifting character of the societal scene are among the factors which have significantly influenced and will doubtless influence all the more in the future the scope and character of library functions and responsibilities. Library and information professionals in the 1980's must have competence in many disciplines in order to serve in information centers, corporation information management, public libraries, and school libraries. The College of Library and Information Services designs its program to meet contemporary information management needs.

The library science education program at the undergraduate level fulfills the State of Maryland's requirements for the Educational Media Associate Certificate, Level I. This is the beginning level of educational media

responsibilities The Associate is a professional person with introductory knowledge, understanding of and competency in media services, with the particular emphasis on the operation of a unified media program Fifteen hours of undergraduate library science courses are offered through the College of Library and Information Services

Because of the universal application of many principles of librarianship and media, students other than education students interested in library and media courses may register for the undergraduate library science courses without being enrolled in the certification program

While the undergraduate program in library science education fulfills a great need in training school library and media personnel and persons to fill special roles, the master's degree program in the College of Library and Information Services is the recognized avenue for preparing fully qualified professionals in the library field

For further information regarding the undergraduate library science education program, refer to the Index listing for "Library Science Education"

College of Physical Education, Recreation and Health

Dean: Burt

The College of Physical Education, Recreation and Health provides preparation leading to the Bachelor of Science degree in the following professional areas physical education (three certification options), health education and recreation The College also offers curricula in safety education, and kinesiological sciences. The College provides research laboratories for faculty members and graduate students who are interested in investigating various parameters of the fields of health education, of physical education, and of recreation and leisure. The service section of each department offers a wide variety of courses for all University students These courses may be used to fulfill the General University Requirements, and as electives.

In addition to its various on-campus offerings, this College regularly conducts courses in physical education, health education and recreation in various parts of the State of Maryland and conducts workshops wherever requested by proper officials.

Programs combining research, service and instruction are provided by the Children's Health and Development Clinic, the Adults' Health and Developmental Program, and the Sports Medicine and Physical Fitness Center.

Indoor and Outdoor Facilities. Four separate buildings and their adjacent playing fields and courts support the academic programs of the College plus the Intramural Sports and Recreation activities.

PERH Building. This building houses the administrative offices of the College and most of its faculty In addition to classrooms, indoor facilities include two gymnasia three multipurpose rooms, a large gymnastic area, a lecture hall, research laboratories, handball-racquetball-squash courts, a weight lifting room, and supporting locker and shower rooms Outdoor facilities include 16 lighted tennis courts and a combination field hockey and lacrosse field.

Cole Student Activities Building. This building is the center for intercollegiate athletics and also serves as a teaching station for classes in swimming and conditioning The swimming pool is divided into two areas by a permanent bulkhead The shallow end is 42×24 feet and the large area is 42×75 feet with a depth ranging from 4 to 13 feet The College maintains locker and shower facilities and an equipment room in this building The Safety Education Program of the Health Education Department also maintains classes and its programs in Cole There are 16 lighted tennis courts west of Cole and four soccer/touch-football fields to support class and intramural sports activities.

Preinkert Field House. There is an additional 75×35 feet swimming pool in Preinkert to serve physical education classes and recreational swimming Supporting locker and shower facilities are available Adjacent to this building are six tennis courts.

Reckord Armory. The Armory gymnasium is used primarily for the intramural sports program, and has 28 880 sq ft of floor space with court markings for basketball, badminton, volleyball, and tennis This facility is also used as an indoor track, with indoor vaulting high and broad jump pits, a one-tenth mile track, and a 70-yard straightaway The Director and staff of the Intramural Sports and Recreation Program have their offices in this building Surrounding the Armory are four touch football fields and eight softball fields, encompassing 18 4 acres These fields, and the four in the Fraternity Row are used for intramural sports.

Outdoor Facilities. The Stadium The stadium, with a seating capacity of 33 536 has a one-quarter mile tartan track with a 220-yard straightaway Pits are available for pole vaulting and high and broad jumping West of the stadium are facilities for the shot put, discus and javelin throw The College of Physical Education, Recreation and Health uses these facilities for classes in track and field

A beautiful 204-acre, 18-hole golf course and lighted driving range are located at the west entrance to the campus These facilities are used for campus golf classes and the ponds on the course are used for canoeing classes

General Information—Entrance Requirements. All students desiring to enroll in the College of Physical Education, Recreation and Health must apply to the Director of Admissions of The University of Maryland College Park

Guidance. At the time of matriculation and first registration each student is assigned to a member of the faculty of the College who acts as the student's academic advisor This faculty member will be in physical education, recreation or health education depending on the student's choice of curriculum The student should confer regularly with his advisor prior to each registration.

Normal Load. The normal University load for students is 12–18 credit hours per semester No student may register for more than 19 hours unless he or she has a B average for the preceding semester and approval of the dean of the College

Electives. Electives should be planned carefully, and well in advance, preferably with the student's academic advisor It is important to begin certain sequences as soon as possible to prevent later conflict Electives may be selected from any department of the University in accordance with a student's professional needs.

Freshman and Sophomore Program. The work of the first two years in this College is designed to accomplish the following purpose (1) provide a general basic or core education and prepare for later specialization by giving a foundation in certain basic sciences, (2) develop competency in those basic techniques necessary for successful participation in the professional courses of the last two years

The techniques courses will vary considerably in the different curriculums and must be satisfactorily completed, or competencies demonstrated before the student can be accepted for the advanced courses in methods and in student teaching It is very important that each requirement be met as it occurs.

Student Teaching. Opportunity is provided for student teaching experience in physical education and school health education The student devotes one semester in the senior year to observation, participation, and teaching under a qualified supervising teacher in an approved Teacher Education Center A University supervisor from the College of Physical Education, Recreation and Health visits the student periodically and confers with the student teacher the cooperating teacher, and the center coordinator, giving assistance when needed

To be eligible for student teaching, the student must (1) *have the recommendation of the University supervising teacher, and (2) must have fulfilled all required courses for the B.S degree except those in the Block Student Teaching Semester, excluding those exceptions approved by each department* The student must obtain a grade of C or better in all professional courses in his or her curriculum and must register for all courses in the "Block" concurrently

Field Work. Recreation major students are expected to carry out a number of field experiences during their University career volunteer or part-time recreation employment during the school year, summer employment in camps or at playgrounds, etc These experiences culminate in a senior semester of field work for which a student receives credit and during which the student works as a staff member (for 20 hours per week) in the field of recreation in which he or she hopes to be employed, such as public recreation, recreation for the exceptional agencies (Y's, scouts, etc), military recreation, etc

Community health education majors are also expected to complete fieldwork during the final semester In the semester immediately preceding the final semester arrangements are made for each student to work for a full semester under the direction of a staff member in a community health agency

Degrees. The degree of Bachelor of Science is conferred upon students who have met the conditions of their curricula as herein prescribed by the College of Physical Education, Recreation and Health

Each candidate for a degree must file a formal application with the Registrations Office during the registration period, or not later than the end of the third week of classes of the regular semester, or at the end of the second week of the summer session, prior to the date of graduation.

Certification. The Maryland State Department of Education certifies for teaching only when an applicant has a tentative appointment to teach in a Maryland county school No certificate may be secured by application of the student on graduation Course content requirements for certification are indicated with each curriculum A student intending to qualify as a teacher in Baltimore, Washington, D C , or other specific situations should secure a statement of certification requirements before starting work in the junior year and discuss them with his or her academic advisor.

Student Organizations and Activities

Physical Education Student Association (PESA). All students enrolled in physical education as either teacher preparation or kinesiological sciences majors, are eligible for membership in this organization The goals of PESA are (1) to encourage participation in local state regional and national professional organizations, (2) to provide opportunities for leadership through involvement in campus, community, and professional activities (3) to promote the study and discussion of current issues, problems, and trends, (4) to assist

in the acquisition of career skill competencies by application in relevant field experiences, (5) to foster a spirit of service to others through volunteer projects, and (6) to sponsor social activities and to develop effective professional relationships.

PESA conducts regular professional meetings featuring guest speakers. Topics explored have included career opportunities in corporate fitness, sports management, education, biomechanics, and current issues, problems, and trends in the field of physical education.

Other PESA sponsored activities include the development of a career handbook, high school interaction and recruitment, intramural sports participation, and trips to state, district and national conventions of the American Alliance for Health, Physical Education, Recreation and Dance. PESA also promotes many corecreational activities including camping, rafting, backpacking, skiing, and experiential education trips.

University of Maryland Recreation and Parks Society. In the fall of 1959 The University of Maryland Recreation and Parks Society was formed by the undergraduate and graduate major and minor students of the College. The society, an affiliate of the State and national recreation organizations, provides opportunities for University and community service, for rich practical experience, and for social experiences for those students having a mutual professional recreation interest.

Gymkana Troupe. The Gymkana Troupe includes men and women students from all Colleges who wish to express themselves through the medium of gymnastics. These individuals coordinate their talents in order to produce an exhibitional performance that has been seen in many places including Bermuda, Iceland, the Azores, Idaho, Montana, and the eastern seaboard of the United States. The organization has three principal objectives: (1) to provide healthful, co-recreational activities that provide fun for the students during their leisure hours, (2) to promote gymnastics in this locality; and (3) to entertain our students and people in other communities.

This organization is co-sponsored by the Physical Education Department and the Student Government Association, and it welcomes any student, regardless of the amount of experience, to join.

Honor Societies

Phi Alpha Epsilon. Honorary Society of the College of Physical Education, Recreation and Health.

The purpose of this organization is to recognize academic achievement and to promote professional growth by sponsoring activities in the fields of physical education, recreation, health and related areas.

Students shall qualify for membership at such times as they shall have attained junior standing in physical education, health or recreation, and have a minimum overall average of 2.7 and a minimum professional average of 3.1. Graduate students are invited to join after 10 hours of work with a 3.3 average. The organization is open to both men and women.

Eta Sigma Gamma. Epsilon chapter was established at The University of Maryland in May of 1969. This professional honorary organization for health educators was established to promote scholarship and community service for health majors at both the graduate and undergraduate levels. Students may apply after two consecutive semesters with a 2.75 cumulative average.

College of Physical Education, Recreation & Health Departments, Programs and Curricula

Health Education

Professor and Chairman: Gilbert
Professors: Burt, Greenberg, Leviton
Associate Professors: Allen, Beck, Clearwater, Feldman, Miller
Assistant Professors: Hollander, McKay
Lecturers: Mann, Sands, Schiraldi
Instructors: Carney, Dotson, Ramsey

Students majoring in health education have two tracks to choose from at the undergraduate level. The first option is community health education which prepares students for entry level health education positions in community settings such as working with voluntary health associations, worksite health promotion programs, or other health agencies. The second option is school health education which prepares a student for teaching health education in schools. In addition to the two major tracks, a minor is available in school health education and two certificate options are available in driver education.

Health Education Curriculum

	Semester Credit Hours	
Freshman Year—School and Community Options	*I*	*II*
ENGL 101—Introduction to Composition	3	
MATH 110 or 102–3–4 or 115—Mathematics		3
HLTH 140—Personal and Community Health	3	
CHEM 111—Chemistry in Modern Life	3	
ZOOL 101—General Zoology		4
JOUR 100—Introduction to Mass Communication		3
PSYC 100—Introduction to Psychology	3	
University Studies Program Requirements		3
SOCY 100—Introduction to Sociology	3	
HLTH 150—First Aid and Emergency Medical Services		2
Total	15	15
Sophomore Year—School and Community Options		
HLTH 230—Introduction to Health Behavior	3	
PHIL 140—Contemporary Moral Issues	3	
ZOOL 201, 202—Human Anatomy and Physiology I and II	4	4
University Studies Program Requirements		9
Required Health Electives	3	3
PSYC 221—Social Psychology	3	
HLTH 105—Science and Theory of Health		2
Total	16	18
Junior Year—School Health Option		
ENGL 391 or 393—Advanced Composition or Technical Writing		3
HLTH 420—Methods and Materials in Health Education		3
EDHD 300S—Human Development and Learning	6	
EDCI 390—Principles and Methods of Secondary Education		3
Required Health Elective		3
EDHD 340—Human Development Aspects of the Helping Relationship	3	
HLTH 390—Organization and Administration of Health Programs	3	
EDMS 410—Principles of Testing and Evaluation		3
EDCP 417—Group Dynamics and Leadership	3	
Total	15	15
Senior Year—School Health Option		
HLTH 340—Curriculum, Instruction and Observation	3	
Required Health Electives	6	
University Studies Program Requirements—Advanced Studies	6	
EDPA 301—Foundations of Education	3	
EDCI 491—Student Teaching in Secondary Schools—Health		12
Total	18	12
Junior Year—Community Health Option		
U.S.P. Junior English Requirement	3	
MICB 100—Basic Microbiology	4	
EDHD 340—Human Development Aspects of the Helping Relationship	3	
EDMS 451—Introduction to Educational Statistics		3
HLTH 390—Organization and Administration of Health Programs	3	
HLTH 420—Methods and Materials in Health Education		3
HLTH 498—Introduction to Community Health		3
SOCY 498A—Medical Sociology		3
HLTH 430—Health Education in the Workplace		3
EDCP 417—Group Dynamics and Leadership	3	
Total	16	15
Senior Year—Community Health Option		
Required Health Electives	9	
HLTH 498C—Community Health Education	3	
FMCD 483—Family and Community Service Systems	3	
HLTH 489—Field Laboratory Projects and Workshops		6
HLTH 386—Field Work		3
HLTH 387—Field Work Analysis		3
Total	15	12

Minor in Health Education: 27-Hour Minor.

Thirteen semester hours in health education (HLTH 140, 150, 310, 420, 450).

Eight semester hours in human anatomy and physiology (ZOOL 201, 202).

Six semester hours of human behavioral science. At least one course should focus on children or youth.

Driver Education Instructors Certification Programs

A. Classroom Instructor—18 semester hours.

Twelve semester hours as follows: HLTH 280, 305, 345 and 375; plus six semester hours selected from the following courses: HLTH 270, 498F, 498L, or ENES 473.

B. Laboratory Instructor—12–15 semester hours.

HLTH 280, 305, 345, plus an internship in driver education (usually six semester credits).

Course Code Prefix—HLTH

Physical Education

Professor and Chairman: Clarke
Professors: Dotson, Ingram, Kelley, Sloan, Steel, Vaccaro
Associate Professors: Church, Hult, Phillips, Santa Maria, Wrenn
Assistant Professors: Arnghi, Clark, DiRocco, Goldfarb, Hatfield, Hurley, Kisabeth, Pike, Ryder, Struna, Tyler, VanderVelden, Young
Instructors: Drum, McHugh, Owens
Lecturers: Brown, Bush, Costello, Fellows, Hoffman, Nelligan

Professional Preparation Curriculum. This curriculum, including three certification options, prepares students (1) for teaching physical education in the secondary school, (2) for coaching, and (3) for leadership in youth and adult groups which offer a program of physical activity. The first two years of this curriculum are considered to be an orientation period in which the student has an opportunity to gain an adequate background in general education as well as in those scientific areas closely related to this field of specialization. In addition, emphasis is placed upon the development of skills in a wide range of motor activities. Further, students are encouraged to select related areas, especially in the fields of biology, social sciences, psychology, health education, and recreation as fields of secondary interest. These materially increase the vocational opportunities which are available to a graduate in physical education.

Equipment: Students may be required to provide individual equipment for certain courses.

Uniforms: Suitable uniforms, as prescribed by the Department, are required for the activity classes and for student teaching. These uniforms should be worn only during professional activities.

Departmental Requirements: All Certification Options

	Semester Credit Hours
University Studies Program Requirements	40
HLTH 150—First Aid and Safety	2
PHYS 101 or 111 or CHEM 102 or 103 or 105	3–4
PHED 180—Foundations of Physical Education	3
ZOOL 101—General Zoology	4
ZOOL 201, 202—Human Anatomy and Physiology	8
EDHD 300—Human Development and Learning	6
PHED 300—Kinesiology	4
EDPA 301—Foundations of Education	3
PHED 314—Methods in Physical Education	3
PHED 333—Physical Activity for Handicapped	3
PHED 385—Motor Learning and Skilled Performance	3
PHED 390—Practicum in Teaching Physical Education	3
PHED 480—Measurement in Physical Education	3
PHED 491—Curriculum in Physical Education	3
PHED Skills Laboratories*	17

* Students should discuss this requirement with departmental advisors.

K–6 Certification Option

PHED 370—Motor Development	3
EDHD 320—Human Development Through the Lifespan	3
EDCI 485—Student Teaching in Elementary School—Physical Education	8
PHED 421—Physical Education for Elementary School. A Movement Approach	3
PHED Electives (6 hours total), PHED 350, PHED 360, or PHED 493	6
Electives	6–7

7–12 Certification Option

EDCI 390—Principles and Methods of Secondary Education	3
PHED 381—Prevention and Care of Athletic Injuries	3
EDCI 495—Student Teaching in Secondary Schools	8
PHED 360—Physiology of Exercise	3
PHED 490—Organization and Administration of Physical Education	3
PHED 493—History and Philosophy of Sport and Physical Education	3
Electives	4–5

K–12 Certification Option

EDCI 390—Principles and Methods of Secondary Education	3
EDCI 485—Student Teaching in Elementary Schools	6
EDCI 495—Student Teaching in Secondary Schools	6
PHED 381—Prevention and Care of Athletic Injuries	3
PHED 421—Physical Education for Elementary School. A Movement Approach	3
PHED 360—Physiology of Exercise	3
PHED 370—Motor Development	3
PHED 490—Organization and Administration of Physical Education	3
PHED 493—History and Philosophy of Sport and Physical Education	3

Kinesiological Sciences Program. This curriculum offers students the opportunity to study the body of knowledge of human movement and sport and to specifically choose programs of study which allow them to pursue a particular goal related to the discipline. There is no intent to orient all students toward a particular specialized interest or occupation.

This program provides a hierarchical approach to the study of human movement. First, a core of knowledge is recognized as being necessary for all students in the curriculum. These core courses are considered foundational to advanced and more specific courses. Secondly, at the "options" level, students may select from two sets of courses which they believe will provide the knowledge to pursue whatever goal they set for themselves in the future. To further strengthen specific areas of interest, students should carefully select related studies courses and electives.

Goal and Objectives. The primary goal of the Kinesiological Sciences Program is to provide a well-rounded, scholarly understanding of the body of knowledge related to human movement. The program core includes exploration of the scientific bases and philosophical and historical knowledges of movement. From this broad knowledge base, the program is to provide for flexibility so that a student may pursue a variety of areas related to physical activity and sport.

	Semester Credit Hours
Freshman Year	
PHED 287—Sport and American Society	3
PHED 293—History of Sport in America	3
Activity Courses *	6
Electives	3
Sophomore Year	
ZOOL 201, 202—Human Anatomy and Physiology	4, 4
PHED 370—Motor Development	3
Activity Courses *	2
Electives	9
Related Studies *	6
Junior Year	
PHED 300—Kinesiology	4
PHED 350—Psychology of Sports	3
PHED 360—Physiology of Exercise	3
PHED 362—Philosophy of Sport	3
PHED 385—Motor Learning and Skilled Performance	3
Option *	3
Related Studies *	6
Senior Year	
PHED 496—Quantitative Methods	3
PHED 497—Independent Studies Seminar	3
Electives	7
Option *	9
Related Studies *	3

In addition to the above required courses, students must fulfill the University Studies Program Requirement. Minimum number of semester hours for degree is 120.

* Students should discuss these requirements with departmental advisors.

The Honors Program in Physical Education. The aim of the Honors Program is to encourage superior students by providing an enriched program of studies which will fulfill their advanced interests and needs. Qualified students are given the opportunity to undertake intensive and often independent studies wherein initiative, responsibility, and intellectual discipline are fostered. To qualify for admission to the program:

1. A freshman must have a B average in academic (college prep) curriculum of an accredited high school.
2. A sophomore must have an accumulative GPA of 3.00 in all college courses of official registration.
3. All applicants must have three formal recommendations concerning their potential, character, and other related matters.
4. All applicants must be accepted by the Faculty Honors Committee.

In completing the program, all honor students must:

1. Participate in an honors seminar where thesis and other relevant research topics are studied.
2. Pass a comprehensive oral examination covering subject matter background.
3. Successfully prepare and defend the honors thesis.

On the basis of the student's performance in the above program, the college may vote to recommend graduation without honors, with honors, or with high honors.

Recreation

Professor and Chairman: Humphrey
Professor: Iso-Ahola
Associate Professors: Churchill, Kuss, Strobell, Verhoven
Assistant Professors: Fedler, Leedy, Richardson, Riddick
Lecturers: Annand, Smith, Ward

This curriculum is designed to meet the needs of students who wish to qualify for positions in the leisure services fields, and for the needs of those students who desire a background which will enable them to render distinct contributions to community life. The Department draws upon various other departments and colleges within the University for courses to balance and enrich its offerings for its leisure studies curriculum. A total of 120 credits are required for the Bachelor of Science Degree, with a limit of 72 credits in RECR

prefix coursework

Those majoring in leisure studies have opportunity for observation and practical experience in local, county, state and federal public recreation programs, in social and group work agency programs, and in the various programs of the Armed Forces, American Red Cross, local hospitals and commercial recreation establishments (e.g. Disney World). Majors are required to select an option area of interest around which to center their elective coursework. These option areas are (1) program services, (2) outdoor recreation, and (3) therapeutic recreation. The development of an area of professional emphasis within an option which is consistent with the student's career goals is encouraged. This area should focus on a specific population, setting, or function within the more general option.

Qualified students are encouraged to apply for membership in Phi Alpha Epsilon or Phi Kappa Phi academic honor societies.

An active student University of Maryland Recreation and Parks Society, an affiliate of the comparable state and national organizations, provides opportunities for University and community service, for practical experience, and for social fellowship with those students having mutual professional interests.

Many outstanding practitioners/educators reside in the Metropolitan Washington, D.C. area. It is the practice of the Department to enrich its course offerings through the use of these individuals as extensively as possible.

Recreation Curriculum

	Semester Credit Hours	
Freshman Year	*I*	*II*
RECR 130—History and Introduction to Recreation	3	
SPCH 100—Basic Principles of Speech Communication		3
GVPT 100/170/273		3
ENGL 101—Introduction to Composition	3	
University Studies Program Requirement	3	6
MATH 110 or higher	3	
Total	12	12
Sophomore Year		
University Studies Program Requirement	10	3
Option Elective	3	3
Option Requirement		3
Option Competency		3
Elective*	3	
RECR 200—Sophomore Seminar		1
RECR 270—Special Populations		3
Total	16	16
RECR 340—Sophomore Summer Field Experience		6
Junior Year		
ENGL 391—Advanced Composition		3
University Studies Program Requirement	3	3
RECR 350—Recreational Use of Natural Areas	3	
RECR 460—Leadership Techniques and Practices		3
RECR 420—Program Planning and Analysis	3	
RECR 490—Organization and Administration		3
Option Elective		6
Option Competency	3	
EDHD—Human Development (Related Requirement)	3	
Total	15	18
Senior Year		
University Studies Program Requirement	3	
RECR 300—Senior Seminar	1	
Option Electives	3	3
Option Requirement	3	
RECR 410—Measurement and Evaluation	3	
RECR 432—Philosophy of Recreation	3	
RECR 341—Senior Field Experience		8
Total	16	11

* Due to variance in the numbers of credits required within individual option areas, not all students will have the same number of University electives. Students should contact the Department for the current *Fact Sheet* regarding coursework adjustments.

Division of Mathematical and Physical Sciences and Engineering

Provost: Dorfman (acting)

The Division of Mathematical and Physical Sciences and Engineering is like a technical institute within a large university. Students majoring in any one of the disciplines encompassed by the Division have the opportunity of obtaining an outstanding education in their field. The Division caters both to students who continue as professionals in their area of specialization, either immediately upon graduation or after postgraduate studies, and to those who use their college education as preparatory to careers or studies in other areas. The narrow specialist as well as the broad "Renaissance person" can be accommodated.

Below are outlined the requirements for each major offered within the Division. Some of the University requirements and regulations are reiterated.

The search for new knowledge is one of the most challenging activities of mankind. The university is one of the key institutions in society where fundamental research is emphasized. The Division of Mathematical and Physical Sciences and Engineering contributes very substantially and effectively to the research activities of the University.

Many research programs include undergraduates either as paid student helpers or in forms of research participation. Students in departmental honors programs are particularly given the opportunity to become involved in research. Other students too may undertake research under the guidance of a faculty member.

A major portion of the teaching program of the Division is devoted to serving students majoring in disciplines not encompassed by the Division. Some of this teaching effort is in providing the skills needed in support of such majors or programs. Other courses are designed as enrichment for non-science students, giving them the opportunity to explore the reality of science without the technicalities required of the major.

Structure of the Division. The College of Engineering is a major constituent of the MPSE Division, and is headed by its own Dean. All other departments and programs in the Division report directly to the Provost of the Division.

The following departments and programs comprise the Division of MPSE:

Department of Computer Science
Department of Mathematics
Department of Meteorology
Department of Physics and Astronomy
Institute for Physical Science and Technology
Applied Mathematics Program
Astronomy Program
Chemical Physics Program
Physical Sciences Program

Within the College of Engineering:
Department of Aerospace Engineering
Department of Chemical and Nuclear Engineering
Department of Civil Engineering
Department of Electrical Engineering
Department of Fire Protection Engineering
Department of Mechanical Engineering
Engineering Materials Program
Engineering Sciences Program
Wind Tunnel Operations Department
Cooperative Engineering Education Program
Agricultural Engineering Program

Degree Programs. The following Bachelor of Science degree programs are offered by the departments and programs of the Division: Astronomy, Computer Science, Mathematics, Physics, Physical Sciences, Aerospace Engineering, Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Engineering (Applied Science Option or Engineering Option), Fire Protection Engineering, Mechanical Engineering, and Nuclear Engineering.

General Information. The MPSE Undergraduate Office, Y–2300 (454–4596) is the central office for coordinating the advising, processing and updating of student records for students not in the College of Engineering. Inquiries concerning University regulations, transfer credits and other general information should be addressed to this office. Specific departmental information is best obtained directly from the departments.

The records of students in the College of Engineering are processed and kept in the Engineering Student Affairs Office, Room 1131, Engineering Classroom Building (454–2421). Inquiries concerning engineering curricula should be addressed there.

The Division is strongly committed to making studies in the sciences and engineering available to all regardless of their background. In particular, the Division is actively pursuing an affirmative action program to rectify the present under-representation of women and minorities in these fields. There are in fact many career opportunities for women and members of minorities in the fields represented by the Division.

Degree Requirements

A. A minimum of 120 semester hours with at least a C average are required for all Bachelor of Science degrees from the Division. All B.S. degrees conferred by the College of Engineering require more than 120 credits, the exact number varies with the department.

B. 39 credit hours which satisfy the University Studies Program as presented under Academic Regulations and Requirements in this catalog. Courses taken to satisfy these requirements may also be used to satisfy major requirements. Students who matriculated prior to Summer 1980 may satisfy this general studies requirement through the General University Requirement program. All students who matriculated in the Summer 1978 session or later, must complete six credits of English Composition.

C. Major and supporting coursework is specified under each department or program.

D. The final 30 semester hours must be completed at the College Park Campus. Occasionally this requirement may be waived by the Provost or Dean for up to six of these 30 credits to be taken at another institution. Such a waiver is granted only if the student already has 30 credits in residence.

E. Students must be enrolled in the program in which they plan to graduate by the time they register for the last 15 hours.

College of Engineering

Dean: Dieter

The College of Engineering offers four-year programs leading either to the degree of Bachelor of Science with curriculum designation in Aerospace Engineering, Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Fire Protection Engineering, Mechanical Engineering, or to the degree of Bachelor of Science in Engineering with an Engineering option or an Applied Science option. One example of the Bachelor of Science in Engineering is Nuclear Engineering. In addition, each of the foregoing degree programs may be pursued through the five-year Maryland Plan for Cooperative Engineering Education. The engineering programs integrate these elements: (1) basic sciences, including mathematics, physics, chemistry, (2) engineering sciences including mechanics of solids and fluids, engineering materials, thermodynamics, electricity, and magnetism, (3) professional studies in major fields of engineering specialization, and (4) general studies including liberal arts and social studies as part of the University Studies Program. Each program lays a broad base for continued learning after college in professional practice, in business and industry, in public service, or in graduate study and research.

General Information. Increasingly, the boundary between engineers and applied scientists or applied mathematicians becomes less distinct. The various branches of engineering similarly interact with each other, as technical problems become more sophisticated, and require a combined attack from several disciplines. The engineer occupies an intermediate position between science and the public, because, in addition to understanding the scientific principles of a situation, he is concerned with the timing, economics and values that define the useful application of those principles.

High School Preparation. Preparation for pursuing an engineering degree curriculum begins in the freshman or sophomore year of high school. The time required to complete the various degree programs may be extended beyond the four years cited in this catalog to the extent that an incoming student may be deficient in his/her high school preparation. Pre-engineering students normally enroll in an *academic* program in high school. The course of study should include 3–1/2 to 4 years of college preparatory mathematics (including algebra, trigonometry, plane and solid geometry and pre-calculus mathematics). In addition, students should complete one year each of physics and chemistry.

Curricula for the various engineering departments are given in this catalog to illustrate how the programs can be completed in four years. These curricula are rigorous and relatively difficult for the average student. Surveys have shown that only about one-third to one-half of the students actually receive an engineering degree in four years. The majority of students (whether at Maryland or at other engineering schools nationwide) complete the engineering program in four and one-half to five years. It is quite feasible for a student to stretch out any curriculum, this may be necessary or desirable for a variety of reasons. However, students should seek competent advising in order to ensure that courses are taken in the proper sequence.

Structure of Engineering Curricula. Courses in the normal curriculum or program and prescribed credit hours leading to the degree of Bachelor of Science (with curriculum designation) are outlined in the sections pertaining to each department in the College of Engineering. No student may modify the prescribed number of hours without special permission from the Dean of the College. The courses in each curriculum may be classified in the following categories:

1. Courses in the University Studies Program Requirements.
2. Courses in the physical sciences—mathematics, chemistry, physics.
3. Collateral engineering courses—engineering sciences, and other courses approved for one curriculum but offered by another department.
4. Courses in the major department. A student should obtain written approval for any substitution of courses from the Department Chairman and the Dean of the College.

The courses in each engineering curriculum, as classified above, form a sequential and developmental pattern in subject matter. In this respect, curricula in engineering may differ from curricula in other colleges. Some regulations which are generally applicable to all students (see the Academic Regulations) may need clarification for purposes of orderly administration among engineering students. Moreover, the College of Engineering establishes policies which supplement the University regulations.

Sample schedules are available as examples of ways to fulfill graduation requirements in eight semesters. Many students find that it is necessary to extend their schedule to nine or ten semesters.

Basic Format of the Freshman-Sophomore Years in Engineering. The freshman and sophomore years in engineering are designed to lay a strong foundation in mathematics, physical sciences and the engineering sciences upon which the student will later develop a professional program during the upper division (junior and senior) years. The College course requirements for the freshman year are the same for all students, regardless of their intended academic program, and about 75% of the sophomore year course requirements are common, thus affording the student a maximum flexibility in choosing a specific area of engineering specialization. Although the engineering student selects a major field at the start of the sophomore year, this intramural program commonality affords the student the maximum flexibility of choice of interdepartmental transfer up to the end of the sophomore year.

Admissions

Freshman: Admission to the College of Engineering is competitive for both freshmen and transfers. Applicants who have designated a major within the College of Engineering will be selected for admission on the basis of academic promise and available space. Different admissions criteria may be in effect for the various engineering departments. Applicants admissible to the University but not to the College will be offered admission to pre-engineering. A Pre-engineering major status does not assure eventual admission to the College of Engineering. *Because of space limitations the College of Engineering may not be able to offer admission to all qualified applicants. The College Park Campus strongly urges early application.*

Transfer: Admission to the College of Engineering is competitive for transfer students. Applicants who have designated a major within the College of Engineering will be selected for admission on the basis of academic promise and available space. Transfer applicants must compete for enrollment in the College based upon the criteria in effect for the semester during which the student wishes to enroll. *Because of space limitations the College of Engineering may not be able to offer admission to all qualified applicants. The College Park Campus strongly urges early application.*

College Regulations

1. The responsibility for proper registration and for satisfying stated prerequisites for any course must rest with the student—as does the responsibility for proper achievement in courses in which the student is enrolled. Each student should be familiar with the provisions of this catalog, including the Academic Regulations.
2. Required courses in mathematics, physics and chemistry have highest priority, and it is strongly recommended that every engineering student register for mathematics and chemistry—or mathematics and physics—each semester until the student has fully satisfied requirements of the College of Engineering in these subjects.
3. To be eligible for a bachelor's degree in the College of Engineering, a student must have an overall average of at least a C—2.0 and a grade of C or better in all courses with an EN prefix. Responsibility for knowing and meeting all degree requirements for graduation in any curriculum rests with the student.
4. A University Studies Program is required of students who entered UMCP beginning in May 1980. The University Studies Program replaces the General University Requirements for students who entered in May 1980 and thereafter. Students who matriculated prior to that date may elect to satisfy either the General University Requirements or the new University Studies Program. All students who matriculated in the Summer 1978 session or later must complete six credits of English composition.
5. All degree programs in the College of Engineering require a minimum of 120 credits plus satisfaction of all department, college, division and University Studies Program requirements. Students should be aware that for all currently existing engineering programs the total number of credits necessary for the degree will exceed 120 by some number that will depend on the specific major and the student's background, especially in English and mathematics.

Basic Freshman Curriculum in Engineering. All freshmen in the College of Engineering are required to complete the following basic curriculum for freshmen regardless of whether the student plans to proceed through one of the major fields designated baccalaureate degree programs or follow any of the multidisciplinary non-designated degree curricula that are sponsored by the College.

	Semester Credit Hours I	II
CHEM 103, 113 General Chemistry*	4	4
PHYS 161—General Physics 1		3
MATH 140, 141—Calculus I, II	4	4
ENES 101—Introductory Engineering Science	3	
ENES 110—Statics		3
University Studies Program Requirements	6	3
Total Credits	17	17

Students who are not prepared to schedule MATH 140 are advised to register for a preparatory course—MATH 115. These students are also advised to attend summer school following their freshman year to complete MATH 141 and PHYS 161 prior to entrance into the sophomore year of study. MATH 141 and PHYS 161 are prerequisites for many courses required in the sophomore year. ENES 110 should be taken in summer school or the fall semester.

* Qualified students may elect to take CHEM 105 and 115 (4 cr. hrs. each) instead of CHEM 103 and 113.

The Sophomore Year in Engineering. With the beginning of the sophomore year the student selects a sponsoring academic department (Aerospace, Agricultural, Chemical, Civil, Electrical, Fire Protection, or Mechanical Engineering), and this department assumes the responsibility for the student's academic guidance, counseling and program planning from that point until the completion of the degree requirements of that department as well as the College. For the specific requirements, see the curriculum listing in each engineering department.

Engineering science courses represent a common core of basic material offered to students of several different departments. All freshman and sophomore students of engineering are required to take ENES 101, and ENES 110. Other ENES courses 220, 221, 230 and 240 are specified by the different departments or taken by the student as electives. The responsibility for teaching the engineering science courses is divided among the Aerospace, Civil, Mechanical, Chemical and Electrical Engineering Departments. In addition to the core courses noted above, several courses of general interest to engineering or non-engineering students have been given ENES designations.

Engineering Transfer Programs. Most of the community colleges in Maryland provide one- or two-year programs which have been coordinated to prepare students to enter the sophomore or junior year in engineering at The University of Maryland. These curricula are identified as *Engineering Transfer Programs* in the catalogs of the sponsoring institutions. The various associate degree programs in technology do not provide the preparation and transferability into the professional degree curricula as the designated transfer programs.

A maximum of one-half of the degree credits (approximately 60–65 semester hours) may be transferred from a two-year community college program.

There may be 6–8 semester hours of major departmental courses at the sophomore level which are not offered by the schools participating in the engineering transfer program. Students should investigate the feasibility of completing these courses in Summer School at The University of Maryland before starting their junior coursework in the fall semester.

Dual Degree Program. The Dual Degree Program is a cooperative arrangement between the College of Engineering and selected liberal arts colleges which allows students to earn undergraduate degrees from both institutions in a five-year program. A student in the Dual Degree Program will attend the liberal arts college for approximately three (3) academic years (minimum 90 hours) and The University of Maryland, College of Engineering for approximately two (2) academic years (minimum hours required—determined individually, approximately 60 hours).

Dual degree candidates may participate in any of the baccalaureate degree programs in the College of Engineering.

At the present time the participating institutions in Maryland and the District of Columbia are American University, Bowie State College, Columbia Union College, Coppin State College, Frostburg State College, Morgan State University, College of Notre Dame of Maryland, St. Mary's College of Maryland, Salisbury State College, Towson State University, Western Maryland College, Trinity College, and Washington College. Also participating in the program are Kentucky State University, King College in Tennessee, Shippensburg State University in nearby Pennsylvania, and Xavier in Louisiana.

Cooperative Engineering Education Program

Program Director: Blair

The Maryland Plan for Cooperative Engineering Education at The University of Maryland, College of Engineering, is a four and one-half to five calendar year program leading to a Bachelor of Science degree. The academic requirements for students following the Co-op Plan of Education are identical to the academic requirements for those students following the regular four-year program. In addition to the normal academic requirements, Co-op students have scheduled periods of professional internship which must be satisfactorily completed to qualify for the baccalaureate degree under the Co-op Plan.

The Co-op Program begins after the student has completed the freshman and sophomore requirements of a major field. The structure of Engineering Co-op is an alternating sequence of study and internship. As far as Co-op is concerned, there are three sessions—fall and spring semesters (20 weeks each) and a summer session (10 weeks). This alternating plan of study and professional internship lengthens the last two academic years into three calendar years. Delaying entry into the Co-op Program until the junior year offers considerable educational advantages to the student.

The student retains the normal freshman-sophomore program to afford time for the selection of a major field of engineering—or to determine whether to continue in engineering—without a commitment to either the regular four-year or the Co-op Plan of Education. A more mature and meaningful series of professional internship assignments are possible to benefit both the student and the professional partner. Also, the plan is readily adaptable to the needs of the student transferring to the University from the engineering transfer programs of community or state colleges.

Students need only meet two criteria for entry into the Engineering Co-op Program. They are (1) completion of the freshman and sophomore engineering requirements (usually about 65 degree credits) and (2) the establishment of a cumulative grade point average at The University of Maryland of at least 2.0/4.0.

A typical study-intern schedule is shown below. The typical student begins the first internship in the summer immediately following the sophomore year (65 accumulated degree credits). The total internship is for two summers and two semesters (60 weeks). Fifty weeks is the required minimum. The student enrolls for 16 semester hours each during the fall and spring semester, 12 semester hours during the summer and three semester hours in the evening during two internship periods.

Typical Study-Intern Schedule

		Semester Hours Current	Accumulated
Summer*	Intern (1)++	—	65
Fall Semester	Study	16	81
Spring Semester†	Intern (2,3)	3§	84
Summer	Study	12	96
Fall Semester†	Intern (4,5)	3§	99
Spring Semester	Study	16	115
Summer*	Intern (6)	—	115
Fall Semester	Study	16	131 (Grad)

* Students enroll for ENCO 408 (6 non-degree credits).

++These numbers refer to 10-week periods.

† Students enroll for ENCO 408 and 409 (12 non-degree credits).

§ These courses could possibly be taken during the evening at University College, or at a college located near your employment.

Although the above study-intern schedule depicts the student interning for 60 weeks, the required *minimum* number is 50 weeks.

Students make their own arrangements for board and lodging while on their periods of internship. Frequently the participating industrial company or governmental agency will assist the student in locating good, inexpensive lodging. The internship wages are paid directly to the student by his employer.

During the semesters or summer sessions in which the student attends school, he pays the regular tuition and fees assessed by the University. A $30 fee is charged for each 10-week period of professional internship. The professional intern fee is payable at the beginning of each intern period and is not refundable.

Instructional Television System

Director: Seigel

The University of Maryland's Instructional Television System (ITV) is headquartered in the College of Engineering. Each semester, over 50 regularly scheduled graduate and undergraduate classes are held in ITV's studio classrooms, and broadcast "live" to government agencies and businesses in the greater Washington area. Students in the remote classrooms watch the broadcasts on large TV monitors. They are able to talk to the instructors and other students using a phone-line "talk back" system. Through the ITV System, working adult students are able to progress toward graduate degrees, primarily in engineering and computer science, without leaving their places of work.

Professional Societies. Each of the major departments sponsors a student chapter or student section of a national engineering society. The student chapters sponsor a variety of activities including technical meetings, social gatherings and college or university service projects. Students who have selected a major are urged to affiliate with the chapter in their department. The names of the organizations are:

Alpha Nu Sigma
American Institute of Aeronautics and Astronautics
American Institute of Chemical Engineers
American Nuclear Society
American Society of Agricultural Engineers
American Society of Civil Engineers
American Society of Mechanical Engineers
Black Engineers Society

Institute of Electrical and Electronic Engineers
Society of Asian Engineers
Society of Fire Protection Engineers
Society of Women Engineers

Engineering Honor Societies. The College of Engineering and each of the engineering departments sponsors an honors society. Nominations or invitations for membership are usually extended to junior and senior students based on scholarship, service and/or other selective criteria. Some of the honors organizations are branches of national societies, others are local groups:

Tau Beta Pi—College Honorary
Alpha Epsilon—Agricultural Engineering
Chi Epsilon—Civil Engineering
Eta Kappa Nu—Electrical Engineering
Omega Chi Epsilon—Chemical Engineering
Pi Tau Sigma—Mechanical Engineering
Salamander—Fire Protection Engineering
Sigma Gamma Tau—Aerospace Engineering

College of Engineering Departments, Programs and Curricula

Aerospace Engineering

Professor and Chairman: Gessow
Professors: Anderson, Donaldson, Melnik
Associate Professors: Barlow, Chopra, Jones, Lee, Winkelmann
Assistant Professor: Fabunmi
Lecturers: Billig, Chander, Chien, Griffin, Hong, Jobanek, Korkegi, Regan, Smith, Vamos, Waltrup, Weissman

Aerospace engineering is concerned with the physical understanding, analysis and design of aerospace vehicles operating within and above the atmosphere. Such vehicles range from helicopters and other vertical take-off aircraft at the low speed end of the flight spectrum to spacecraft operating at thousands of miles per hour during entry into the atmospheres of the earth and other planets. In between are general aviation and commercial transports flying at speeds well below and close to the speed of sound, and supersonic transports, fighters and missiles which cruise at many times the speed of sound. Although each speed regime and each vehicle type poses its own special research, analysis and design problems, each can be addressed by a common set of technical specialities or disciplines.

Consider the high-speed flight of NASA's Space Shuttle. The airflow over the wings, fuselage and tail surfaces create lift, drag and moments on the aircraft. If the velocity is high enough, such as during reentry of the Space Shuttle into the earth's atmosphere, then the temperature of the airflow becomes extremely high, the air becomes chemically reactive, and heating of the vehicle's surface becomes a major problem. The study of how and why the airflow produces these forces, moments and heating is called *aerodynamics*. In turn, the motion of the aircraft or space vehicle will respond to, indeed will be determined by, the aerodynamic forces and moments. The study of the motion and flight path of such vehicles is called *flight dynamics*. Of course, while executing this motion, the vehicle must be structurally sound, that is, its surface and internal structure must be able to withstand the severe forces and loads associated with flight. The study of the mechanical behavior of materials, stresses and strains, deflections and vibrations that are associated with the structure of the vehicle itself is called *flight structures*. In the same vein, the motion of any aircraft or space vehicle must be initiated and maintained by a propulsive mechanism such as the classic combination of a reciprocating engine with a propeller, or the more modern turbojets, ramjets and rockets. The study of the physical fundamentals of how these engines work is called *flight propulsion*. Finally, all of the above are synthesized into one system with a specific application—such as a complete transport aircraft or a missile— through a discipline called *aerospace vehicle design*.

The Department of Aerospace Engineering at The University of Maryland offers a rigorous and balanced education which includes all of the above disciplines. The goal of this program is to create professional aerospace engineers with an understanding of the physical fundamentals underlying atmospheric and space flight, and with the capability of applying this knowledge for research, analysis and design purposes. Moreover, the physical background and design synthesis that marks aerospace engineering education also prepares a student to work productively in other fields such as energy and surface transportation.

The facilities of the department include three subsonic wind tunnels (with test sections ranging from 2 by 2 ft to 7 75 by 11 ft), one supersonic tunnel, equipment for the static and dynamic testing of structural components, and a flight simulator. A computational facility with remote terminals located in the department provides access to the University's central computer system.

Aerospace Engineering Curriculum

	Semester Credit Hours	
	I	*II*
Sophomore Year		
University Studies Program Requirements	3	3
MATH 240—Linear Algebra	4	
MATH 241—Calculus III		4
PHYS 262, 263—General Physics	4	4
ENES 240—Engineering Computation	3	
ENES 220—Mechanics of Materials		3
ENAE 201, 202—Introduction to Aerospace Engineering I, II	2	2
Total	16	16
Junior Year		
University Studies Program Requirements	3	3
MATH 246—Differential Equations	3	
ENES 221—Dynamics	3	
ENME 217—Thermodynamics		3
ENEE 300—Principles of Electrical Engineering	3	
ENAE 305—Aerospace Laboratory I		3
ENAE 345—Introduction to Dynamics of Aerospace Systems		3
ENAE 451, 452—Flight Structures I, II	4	3
ENAE 371—Aerodynamics I		3
Total	16	18
Senior Year		
ENAE 471—Aerodynamics II		3
ENAE 475—Viscous Flow and Aerodynamic Heating		3
ENAE 401—Aerospace Laboratory II		2
ENAE 402—Aerospace Laboratory III		1
ENAE 461—Flight Propulsion I		3
University Studies Program Requirements		9
Design Elective[1]		3
Applied Dynamics Elective[2]		3
Aerospace Elective[3]		3
Technical Elective[4]		3
Total		33

Minimum Degree Credits—120 and the fulfillment of all Department, College, Division, and University requirements.

[1] The student shall take one of the following design courses:
ENAE 411 Aircraft Design (fall)
ENAE 412 Design of Aerospace Vehicles (spring)

[2] The student shall take one course which utilizes dynamics in a system analysis. The following courses are offered:
ENAE 445 Stability and Control of Aerospace Vehicles (fall)
ENAE 355 Aircraft Vibrations (spring)

[3] Three credits must be taken from elective courses offered by the Aerospace Engineering Department. Currently offered courses are:
ENAE 415 Computer-Aided Struct. Design Analysis (spring)
ENAE 453 Matrix Methods in Computational Analysis (fall)
ENAE 457 Flight Structures III (fall)
ENAE 462 Flight Propulsion II (spring)
ENAE 472 Aerodynamics III (fall)
ENAE 473 Aerodynamics of High Speed Flight (not offered every year)
ENAE 488 Topics in Aerospace Engineering
ENAE 499 Elective Research
Courses listed under 2 and 3 above and which are not used to meet the requirements of 2 and 3 may be elected to fulfill requirement 4.

[4] Courses available as aerospace electives may be taken as the technical elective; or any other technical course with a number of 300 or above if offered to majors in the College of Engineering or in the Departments of Mathematics and Physics.

Course Code Prelix—ENAE

Agricultural Engineering

Associate Professor and Chairman: Stewart
Professors: Felton (Emeritus), Green (Emeritus), Harris, Krewatch (Emeritus), Wheaton
Associate Professors: Grant, Johnson, Merrick (Emeritus), Ross
Assistant Professors: Magette, Muller, Rebuck, Yaramanoglu
Senior Specialist: Brodie
Instructors: Carr, Gird, Hochheimer, Smith
Visiting Professor: Yeck
Affiliate Assistant Professor: Brinsfield

Agricultural engineering utilizes both the physical and biological sciences to help meet the needs of our increasing world population for food, natural fiber and improvement or maintenance of the environment. Scientific and engineering principles are applied to the conservation and utilization of soil and water resources for food production and recreation, to the utilization of energy to improve labor efficiency and to reduce laborious and menial tasks, to the design of structures and equipment for housing or handling of plants and animals to optimize growth potential, to the design of residences to improve the standard of living for the rural population, to the development of methods and equipment to maintain or increase the quality of food and natural fiber, to the flow of supplies and equipment to the agricultural and aquacultural production units, and to the flow of products from the production units and the processing plants to the consumer. The agricultural engineer places emphasis

on maintaining a high quality environment as he works toward developing efficient and economical engineering solutions

The undergraduate curriculum provides opportunity to prepare for many interesting and challenging careers in design, management, research, education, sales, consulting, or international service. The program of study includes a broad base of mathematical, physical and engineering sciences combined with basic biological sciences. Twenty-two hours of electives gives flexibility so that a student may plan a program according to his major interest.

Students with interest in agricultural engineering may enroll through either the College of Engineering or the College of Agriculture. However, all agricultural engineering majors must meet admission, progress and retention standards of the College of Engineering.

	Semester Credit Hours I	II
Freshman Year		
MATH 140, 141—Calculus I, II	4	4
CHEM 103, 113*—General Chemistry I, II	4	4
BOTN 101 or ZOOL 101	4	
ENES 101—Introductory Engineering Science	3	
ENES 110—Statics		3
PHYS 161—General Physics I		3
University Studies Program Requirements***	3	3
Total	18	17
Sophomore Year		
MATH 241—Calculus III	4	
MATH 246—Differential Equations for Scientists & Engineers		3
PHYS 262, 263—General Physics	4	4
ENES 220—Mechanics of Materials	3	
ENES 221—Dynamics		3
ENME 217—Thermodynamics		3
Free Elective	3	
University Studies Program Requirements***	3	3
Total	17	16
Junior Year		
ENME 300 (or ENCE 300)—Materials Science and Engineering	3	
ENME 342 (or ENCE 330)—Fluid Mechanics	3	
ENEE 300—Principles of Electrical Engineering		3
ENCE 350—Structural Analysis	3	
ENAG 454—Biological Process Engineering		4
Technical Electives**	4	6
University Studies Program Requirements***	3	3
Total	16	16
Senior Year		
ENAG 421—Power Systems	3	
ENAG 444—Functional Design of Machines and Equipment		3
ENAG 422—Soil and Water Engineering	3	
ENAG 424—Functional and Environmental Design of Agricultural Structures		3
Technical Electives**	3	3
Free Elective	3	
University Studies Program Requirements***	3	6
Total	15	15

Minimum Degree Credits—120 credits and fulfillment of all Department, College, Division, and University requirements.

* CHEM 104 may be substituted for CHEM 113. Check with an advisor regarding the chemistry requirement before registering.

** Technical electives, related to field of concentration, must be selected from a departmentally approved list. Nine credits must be 300 level and above.

*** Students must consult with departmental advisors to ensure the selection of appropriate courses for their particular program of study.

Course Code Prefix—ENAG

Chemical and Nuclear Engineering

Professor and Chairman: Roush
Professors: Beckmann, Cadman, Gentry, Hsu, McAvoy, Regan, Schroeder (p.t.), Smith
Associate Professor: Gasner
Assistant Professors: Calabrese, Choi, Davisson

The Chemical and Nuclear Engineering Department offers programs in chemical, materials and nuclear engineering. In addition, study programs in the areas of applied polymer science, biochemical engineering, and process simulation and control are available. The latter programs are interdisciplinary with other departments at the University. The departmental programs prepare an undergraduate for graduate study or immediate industrial trial employment following the baccalaureate degree.

The Chemical Engineering Program emphasizes the application of basic engineering and economic principles—and basic sciences of mathematics, physics and chemistry—to process industries concerned with the chemical transformation of matter. The chemical engineer is primarily concerned with research and process development leading to new chemical process ventures or a better understanding of existing ones, with the efficient operation of the complete chemical plant or its component units, with the technical services engineering required for improving and understanding chemical plant operation and the products produced, with the chemical sales and economic distribution of the chemical plant product, and with the general management and executive direction of chemical process industry plants and industrial complexes.

Because of this wide range of ultimate applications, the chemical engineer finds interesting and diverse career opportunities in such varied fields as chemical (inorganic and organic), food processing and manufacture, metallurgical, nuclear and energy conversion, petroleum (refining, production, or petrochemical), and pharmaceutical industries. Additional opportunities are presented by the research and development activities of many public and private research institutes and allied agencies.

	Semester Credit Hours I	II
Sophomore Year		
MATH 241—Calculus III	4	
MATH 246—Differential Equations		3
PHYS 262, 263–General Physics	4	4
ENES 230—Intro. to Materials and Their Applications		3
CHEM 233—Organic Chemistry I	4	
CHEM 243—Organic Chemistry II		4
ENCH 215—Chem. Engr. Analysis	3	
ENCH 280—Transport Processes I: Fluid Mechanics		2
University Studies Program Requirements	3	
Total	18	16
Junior Year		
ENCH 300—Chemical Process Thermodynamics	3	
ENCH 440—Chemical Engr. Kinetics		3
ENCH 442—Chemical Engr. Systems Analysis and Dynamics		3
CHEM 481, 482—Physical Chemistry I, II	3	3
CHEM 483—Physical Chemistry Laboratory I	2	
ENCH 425, 427—Transport Process II: Heat Transfer; III: Mass Transfer	3	3
ENEE Elective*	3	
University Studies Program Requirements	3	6
Total	17	18
Senior Year		
ENCH 437—Chemical Engineering Lab	3	
ENCH 444—Process Engr. Economics and Design I	3	
ENCH 446—Process Engr. Econ. and Design II		3
ENCH 333—Seminar		1
Technical Electives	6	6
University Studies Requirements	3	6
Total	15	16

Minimum Degree Credits—120 credits and fulfillment of all Department, College, Division, and University requirements.

* ENEE 300 is recommended course.

Technical Elective Guidelines

CHEMICAL ENGINEERING

Twelve (12) credits of technical electives are required. It is recommended that they be taken during the senior year.

Additional guidelines are as follows:

1. Two courses must be taken in one of the areas of specialization given below. One of these two courses must be a lecture course; the other, a laboratory course.
2. The remaining technical electives will nominally also be chosen from the list given. Upon the approval of your advisor and written permission of the Department Chairman or Program Director, a limited degree of substitution may be permitted. Substitutes, including ENCH 468—Research (1–3 cr.) must fit into an overall plan of study emphasis.
3. As noted, several of the technical elective courses are sequenced. Check recommended prerequisites when planning your technical electives.

Technical Electives—Chemical Engineering Program

Biochemical Engineering

ENCH 482 Biochemical Engineering (3) Fall semester.
ENCH 485 Biochemical Engineering Laboratory (2) Spring semester, recommended only if ENCH 482 is taken. Simultaneous enrollment in ENCH 468 (1 credit) is recommended.

Polymers

ENCH 490 Introduction to Polymer Science (3) Fall semester.
ENCH 492 Applied Physical Chemistry of Polymers (3) Fall semester.
ENCH 494 Polymer Technology Laboratory (3) Spring semester.

Recommended if ENCH 490 or 492 is taken

ENCH 496 Processing of Polymer Materials (3) Spring semester. Recommended only if ENCH 490 or 492 is taken.

Chemical Processing

ENCH 450 Chemical Process Development (3) Fall semester

ENCH 468A Research-Economics of Fuel and Energy Related Processes (3) Fall semester

ENCH 468B Research-Chemical Engineering Economics (3) Spring Semester

Processing Analysis and Optimization

ENCH 452 Advanced Chemical Engineering Analysis (counts as Lab) (3) Fall semester

ENCH 453 Applied Mathematics in Chemical Engineering (3) Spring semester

ENCH 454 Chemical Process Analysis and Optimization (3) Spring semester

Course Code Prefix—ENCH

Civil Engineering

Professor and Chairman: Colville
Professors: Albrecht, Birkner, Carter, Halpin, McCuen, Ragan, Sternberg, Witczak
Associate Professors: Aggour, Garber, Goodings, Schelling, Schonfeld, Schwartz, Vannoy, Wolde-Tinsae
Assistant Professors: Ayyub, Bernold, Chang, Hao, Perl, Saklas, Smith, Walters
Senior Research Associate: Rib

Civil Engineering Curriculum

Civil engineering is concerned with the planning, design, construction and operation of large facilities associated with man's environment. Civil engineers specialize in such areas as environmental engineering, transportation systems, structures, water resource development, water supply and pollution control, building foundations and dams, urban and regional planning, construction management, and air pollution control. Many civil engineers enter private practice as consulting engineers or start their own businesses in industry. Others pursue careers with local, state, and federal agencies or with large corporations.

The undergraduate program is founded on the basic sciences and emphasizes the development of a high degree of technical competence. The program orients the student toward computer-aided design techniques and prepares the student to incorporate new concepts that will develop during his or her professional career. Further, the program stresses the balance between technical efficiency and the needs of society. The graduate is prepared to enter one of the areas mentioned above, or he or she can move into new areas of specialization such as oceanographic engineering or the development of facilities for extra-terrestrial environments.

At no time has man been more concerned with the quality of the environment. Man is concerned with broad environmental problems such as pollution and the operation of transportation systems. Man is also concerned with problems such as a need for new approaches in the design and construction of buildings. The civil engineering profession faces the greatest challenge in its history as it assumes a central role in the solution of the physical problems facing the urban-regional complex.

	Semester Credit Hours	
Sophomore Year	*I*	*II*
MATH 241—Analysis III	4	
MATH 246—Differential Equations for Scientists and Engineers		3
PHYS 262, 263—General Physics II, III	4	4
ENES 220—Mechanics of Materials	3	
ENES 221—Dynamics		3
ENCE 280—Engineering Survey Measurements	3	
ENCE 221—Introduction to Environmental Engineering		3
University Studies Program Requirements	3	3
Total	17	16
Junior Year		
ENCE 300—Fundamentals of Engineering Materials	3	
ENCE 330—Basic Fluid Mechanics	3	
ENCE 340—Fundamentals of Soil Mechanics		3
ENCE 350, 351—Structural Analysis and Design I, II	3	3
ENCE 360—Engineering Analysis and Computer Programming	4	
ENCE 370—Fundamentals of Transportation Engineering	3	
ENME 320—Thermodynamics or ENCH 300—Chemical Process Thermodynamics		3
ENCE—Technical Elective*		3
University Studies Program Requirements		6
Total	16	18
Senior Year		
ENCE—Technical Elective (Group A, B, C, D, E or F)*	7	***3
ENCE—Technical Elective	**3	**3
ENEE 300—Principles of Electrical Engineering		3
Technical Elective**		3
University Studies Program Requirements	6	3
Total	16	15

Minimum Degree Credits—120 credits and fulfillment of all Department, College, Division, and University requirements

* See notes concerning Technical Electives

** One course from available Technical Electives in Civil Engineering or approved Technical Elective outside department

*** These numbers represent three-semester-credit courses

Additional semester credits will be involved to the extent that courses carrying more than three credits are selected.

Notes Concerning Technical Electives in Civil Engineering

A minimum of 22 credit hours of technical electives are required as follows:

1. All 3 courses from one area of concentration A, B, C, D, E or F
2. Any 4 courses from the entire technical list, such that the following is met
   (a) One course must be from Area G
   (b) No more than 2 courses within any area of concentration A, B, C, D, E, F or G.

Areas of Concentration

A *Structures.* ENCE 450 (3), 451 (4), 452 (3).
B *Water Resources:* ENCE 430 (4), 431 (3), 432 (3).
C *Environmental:* ENCE 433 (3), 434 (3), 435 (4).
D *Transportation:* ENCE 470 (4), 473 (3), 474 (3)
E *Geotechnical:* ENCE 440 (4), 441 (3), 442 (3)
F *Construction Engineering Management:* ENCE 421 (3), 489C (4), 489E (3)
G *Support Courses:* ENCE 410 (3), 461 (3), 463 (3), 489 (3).

Course Code Prefix—ENCE

Electrical Engineering

Professor and Chairman: Davisson
Professors: Baras, Blankenship, Chu, DeClaris, Davis, Destler, Ephremides, Galloway, Granatstein, Harger, Hochuli, Lee, Levine, Ligomenides, Lin, Mavergoyz, Newcomb, Ott, Peckerar, Reiser, Rhee, Striffler, Taylor
Associate Professors: Antonsen, Emad, Gligor, Goldhar, Ja' Ja', Krishnaprasad, Makowski, Pugsley, Silio, Tits, Tretter, Zaki
Assistant Professors: Abed, Farvardin, Geraniotis, Ho, Ioannou, Nakajima, Naravan, Shamma, Webb
Adjunct Professor: Ftehenakis

The program in the Electrical Engineering Department features flexibility by means of a broad elective structure (inside and outside the Department). The student may attain breadth or specialization as he/she chooses.

Areas stressed include such fields as electronics, integrated circuits, solid state devices, lasers, communication engineering, information theory and coding engineering, system theory, computer software and hardware, particle accelerators, electro-mechanical transducers, energy conversion, and many others.

Apprenticeship programs allow qualified undergraduate students to work with research laboratory directors in the Department, thus giving the student a chance for a unique experience in research and engineering design.

Projects in electrical engineering allow undergraduate students to do independent study under the guidance of a faculty member in an area of mutual interest.

The technological problems and needs of society are becoming steadily more complex. The engineer is the intermediary between science and society. To solve the problems of modern society he/she must fully understand the most modern devices and methodologies available. To find the best solution he/she must have a broad education. To find a solution that is also acceptable to society he/she must be concerned with the economic, ecologic and human factors involved in the problem. Finally, current problems frequently require a thorough knowledge of advanced mathematics and physics.

The curriculum of the Electrical Engineering Department reflects the diverse requirements cited above. A basic mathematical, physical and engineering sciences foundation is established in the first two years. Once this foundation is established, the large number of electrical engineering courses and the flexibility of the elective system allow a student to specialize or diversify and to prepare for a career either as a practicing engineer or for more theoretically oriented graduate work.

To go along with this freedom, the Department has a system of undergraduate advising. The student is encouraged to discuss his/her program and career plans with the advisor in order to get maximum benefit from the curriculum.

	Semester Credit Hours I	II
Sophomore Year		
University Studies Program Requirements	3	3
MATH 246—Differential Equations		3
MATH 241—Calculus III	4	
PHYS 262, 263-General Physics	4	4
ENES 240—Engineering Computation	3	
ENES 221—Dynamics	3	
ENEE 204—Systems and Circuits I		3
ENEE 250—Computer Structures		3
Total	17	16
Junior Year		
MATH xxx—Advanced Elective Math*	3	
ENEE 322—Signal and System Theory	3	
ENEE 380—Electromagnetic Theory	3	
ENEE 381—Elect Wave Propagation		3
ENEE 304—Systems & Circuits II	3	
ENEE 305—Fundamental Laboratory	2	
ENEE 324—Engineering Probability		3
ENEE 314—Electronic Circuits		3
ENEE xxx—Advanced Elective Lab*		2
Electives*		3
University Studies Program Requirements	3	3
Total	17	17
Senior Year		
Electives*	9	12
University Studies Program Requirements	6	3
Total	15	15

Minimum Degree Credits—120 credits and fulfillment of all Department, College, Division and University requirements.

* The 29 elective credits must satisfy the following conditions Fourteen credits must be 400 level ENEE courses, including at least two credits of advanced laboratory courses. Twelve credits must be non-electrical- engineering (mathematics, physics, other fields of engineering, etc) and must be selected from the Electrical Engineering Department's approved list; at least three credits of these twelve must be a 400 level math course from the departmental list. The remaining three credits may be either 400 level ENEE or from the departmental list In all cases the student's elective program must be approved by an Electrical Engineering advisor and, in addition, by the Office of Undergraduate Studies of the Electrical Engineering Department.

ENEE Advanced Elective Laboratories

- ENEE 407 Microwave-Circuits Laboratory (2)
- ENEE 413 Electronics Laboratory (2)
- ENEE 445 Computer Laboratory (2)
- ENEE 461 Control Systems Laboratory (2)
- ENEE 473 Transducers and Electrical Machinery Laboratory (1)
- ENEE 483 Electromagnetic Measurements Laboratory (2)

Throughout the year students are urged to contact the Electrical Engineering Office of Undergraduate Studies for advice or any other matter related to their studies.

Course Code Prefix—ENEE

Engineering Sciences

Engineering science courses represent a common core of basic material offered to students of several different departments. All freshman and sophomore students of engineering are required to take ENES 101, and ENES 110. Other ENES courses 220, 221, 230 and 240 are specified by the different departments or taken by the student as electives. The responsibility for teaching the engineering science courses is divided among the aerospace, civil, mechanical, chemical and electrical engineering departments. In addition to the core courses noted above, several courses of general interest to engineering or non-engineering students have been given ENES designations.

Course Code Prefix—ENES

Fire Protection Engineering

Professor and Chairman: Bryan
Lecturer: Milke
Lecturers (part-time): DiNenno, Walton

Fire protection engineering is concerned with the scientific and technical problems of preventing loss of life and property from fire, explosion and related hazards, and of evaluating and eliminating hazardous conditions.

The fundamental principles of fire protection engineering are relatively well-defined and the application of these principles to a modern industrialized society has become a specialized activity Control of the hazards in manufacturing processes calls for an understanding not only of measures for the protection but of the processes themselves. Often the most effective solution to the problem of safeguarding a hazardous operation lies in the modification of special extinguishing equipment The fire protection engineer must be prepared to decide in any given case what is the best and most economical solution of the fire prevention problem His or her recommendations are often based not only on sound principles of fire protection but on a thorough understanding of the special problems of the individual property

Modern fire protection utilizes a wide variety of mechanical and electrical equipment which the student must understand in principle before he or she can apply them to special problems The fire protection curriculum emphasizes the scientific technical and humanitarian aspects of fire protection engineering and the development of the individual student

The problems and challenges which confront the fire protection engineer include the reduction and control of fire hazards due to processes subject to fire or explosion in respect to design, installation and handling, involving both physical and human factors, the use of buildings and transportation facilities to restrict the spread of fire and to facilitate the escape of occupants in case of fire; the design, installation and maintenance of fire detection and extinguishing devices and systems, and the organization and education of persons for fire prevention and fire protection.

	Semester Credit Hours I	II
Sophomore Year		
University Studies Program Requirements	3	3
MATH 240—Linear Algebra or MATH 241—Analysis III	4	
MATH 246—Differential Equations		3
PHYS 262, 263—General Physics	4	4
ENES 221—Dynamics	3	
ENES 220—Mechanics of Materials		3
ENFP 251—Introduction to Fire Protection Engineering	3	
ENFP 290—Fire Protection Fluids		3
Total	17	16
Junior Year		
University Studies Program Requirements	3	3
CMSC 110—Elementary Algorithmic Analysis (4) or ENES 240—Engineering Computation (3)	3–4	
ENME 320—Thermodynamics or ENCH 300—Chemical Process Thermodynamics		3
ENCE 300—Fundamentals of Engineering Materials or ENME 300—Materials Science and Engineering		3
ENCE 330—Fluid Mechanics	3	
ENFP 315—Fire Protection Design II		3
ENFP 310—Fire Protection Systems Design I	3	
ENFP 320—Pyrometrics of Materials	3	
ENFP 321—Functional and Life Safety Analysis		3
Approved Electives	2	2
Total	17–18	17
Senior Year		
University Studies Program Requirements	3	6
ENNU 310—Environmental Aspects of Nuclear Engineering or ENEE 300—Principles of Electrical Engineering	3	
ENFP 412—Heat Transfer in Fire Protection	3	
ENFP 417—Fire Protection Hydraulic Design	3	
ENFP 411—Fire Protection Hazard Analysis		3
ENFP 416—Problem Synthesis and Design		3
ENFP 489—Special Topics (elective)*	3	3
Total	15	15

Minimum Degree Credits—120 credits and fulfillment of all Department, College, Division, and University requirements.

* Three credits of technical electives must be in ENFP

Course Code Prefix—ENFP

Mechanical Engineering

Professor and Chairman: Fourney
Professors: Allen, Anand, Armstrong, Berger, Buckley, Cunniff, Dally, Dieter, Durelli, Holloway, Hyer, Irwin, Koh, Marcinkowski, Marks, Sallet, Sanford, Sayre, Shreeve, Talaat, Wallace, Yang
Associate Professors: Barker, Bernard, Gupta, Hayleck, Kirk, Shih, Walston
Assistant Professors: Azarm, Chen, Chow, DiMarzo, Hammer, Harhalakis, Loftus, Mecklenburg, Palmer, Pandelidis, Pecht, Radermacher, Ssemakula, Tsui
Instructors: Majid, Oktay, Wilson
Lecturers: Baker, Case, Coder, Der, Etheridge, Gaunaurd, Krumins, Reed, Werneth
Research Associates: Dainis, O'Hara, Wang

The primary function of the mechanical engineer is to create devices, machines, structures or processes which are used to advance the welfare of mankind. Design, analysis and testing are the essential steps in these developments. Of particular importance are the aspects of engineering science and art relating to the generation and transmission of mechanical power, the establishment of both experimental and theoretical models of mechanical systems, the static and dynamic behavior of fluids and the criteria for the selection of materials used in design. Emphasis is also given to the proper coordination and management of facilities and personnel to achieve a successful product or service.

The responsibility of the mechanical engineering profession is extremely broad. The following divisions of the American Society of Mechanical Engineers indicate many of the technical areas in which the mechanical engineer may work: advanced energy systems, aerospace, air pollution control, applied mechanics, bioengineering, computer engineering, design engineering, diesel and gas engine power, dynamic systems and control, fluids engineering, fuels, gas turbine, heat transfer, lubrication, management, materials handling engineering, noise control and engineering, nuclear engineering, ocean engineering, petroleum, plant engineering and maintenance, power, pressure vessels and piping, process industries, production engineering, rail transportation safety, solar energy, solid waste processing, technology and society, and textile industries.

There are many career opportunities in all of these fields. In particular, the functional activities of design, systems analysis, management, consulting, research, maintenance, production, teaching and sales offer challenging and rewarding futures.

Because of the wide variety of professional opportunities available to the mechanical engineer, the curriculum is designed to provide the student with a thorough training in basic fundamentals including physics, chemistry, mathematics, mechanics, thermodynamics, materials, heat transfer, computers, electronics, power and design. The curriculum leads to the degree of Bachelor of Science in Mechanical Engineering which is usually sufficient for early career opportunities in industry or the government. Advanced graduate programs are available for continued study leading to Master of Science and Doctor of Philosophy degrees.

	Semester Credit Hours	
	I	*II*
Sophomore Year		
University Studies Program Requirements	3	3
MATH 241—Analysis III	4	
MATH 246—Differential Equations		3
PHYS 262, 263—General Physics II, III	4	4
ENES 220—Mechanics of Materials	3	
ENES 221—Dynamics		3
ENME 205—Engineering Analysis and Computer Programming	3	
ENME 217—Thermodynamics		3
Total	17	16
Junior Year		
University Studies Program Requirements	6	3
ENEE 300—Principles of Electrical Engineering	3	
ENEE 301—Electrical Engineering Laboratory	1	
ENME 300—Materials Engineering		3
ENME 301—Materials Engineering Laboratory		1
ENME 315—Intermediate Thermodynamics		3
ENME 321—Transfer Processes		3
ENME 342—Fluid Mechanics	3	
ENME 343—Fluid Mechanics Lab	1	
ENME 360—Dynamics of Machinery	3	
ENME 381—Measurements Laboratory		3
Total	17	16
Senior Year		
University Studies Program Requirements	3	3
ENME 400—Machine Design	3	
ENME 403—Automatic Controls	3	
ENME 404—Mechanical Engineering Systems Design		4
ENME 405—Energy Conversion Design	3	
ENME 480—Engr Experimentation		3
Technical Elective (Design Group)*		3
Technical Elective	3	3
Total	15	16

Minimum Degree Credits—120 credits and fulfillment of all Department, College, Division and University requirements

* Design oriented elective approved by Department Chairman.

Technical Electives

ENME 402—Selected Topics in Engineering Design (3)
ENME 410—Operations Research I (3)
ENME 411—Introduction to Industrial Engineering (3)
ENME 412—Mechanical Design for Manufacturing and Production (3)
ENME 414—Computer-aided Design (3)
ENME 415—Engineering Applications of Solar Energy (3)
ENME 422—Energy Conversion II (3)
ENME 423—Environmental Engineering (3)
ENME 424—Advanced Thermodynamics (3)
ENME 442—Fluid Mechanics II (3)
ENME 450—Mechanical Engineering Analysis for the Oceanic Environment (3)
ENME 451—Mechanical Engineering Systems for Underwater Operations (3)
ENME 452—Physical and Dynamical Oceanography (3)
ENME 453—Ocean Waves, Tides and Turbulences (3)
ENME 461—Dynamics II (3)
ENME 462—Introduction to Engineering Acoustics (3)
ENME 463—Mechanical Engineering Analysis (3)
ENME 464—Machine Design II (3)
ENME 465—Introductory Fracture Mechanics (3)
ENME 488—Special Problems (3)
ENME 489—Special Topics in Mechanical Engineering (3)

In the Mechanical Engineering Department at the graduate level there are several areas of specialization which are listed below. The undergraduate student may select technical electives from one or more of these areas of specialization. Students planning to continue on in the graduate program should preferably choose electives to provide the best background for their major area. The subject material of interest to each field of specialization is:

I. Computer Integrated Manufacturing and Design
   a. Computer aided engineering and design
   b. Traditional and modern manufacturing processes
   c. Materials handling systems; robotics
   d. Systems analysis and control
   e. Plant organization and production control techniques
II. Energy
   a. Thermodynamics
   b. Heat transfer
   c. Energy conversion
   d. Solar energy
III. Fluid Mechanics
   a. Compressible and incompressible flow
   b. Viscous flow
   c. Hydrodynamics
   d. Marine and ocean engineering
IV. Solid Mechanics
   a. Continuum mechanics
   b. Dynamics, vibrations and acoustics
   c. Elasticity, plasticity and viscoelasticity
   d. Plates, shells and structures
   e. Experimental mechanics

Course Code Prefix—ENME

Bachelor of Science Degree in Engineering

General Regulations for the B.S.—Engineering Degree. All undergraduate students in engineering will select their major field sponsoring department at the beginning of their second year regardless of whether they plan to proceed to a designated or an undesignated degree. A student wishing to elect the undesignated degree program may do so at any time following the completion of the sophomore year, or a minimum of 50 earned credits towards any engineering degree, and at least one semester prior to the time the student expects to receive the baccalaureate degree. As soon as the student elects to seek an undersignated baccalaureate degree in engineering, the student's curriculum planning, guidance and counseling will be the responsibility of the "Undesignated Degree Program Advisor" in the primary field department. *At least one semester before the expected degree is to be granted, the student must file an "Application for Admission to Candidacy for the Degree of Bachelor of Science in Engineering"* with the Dean's Office of the College of Engineering. The candidacy form must be approved by the chairman of the primary field department, the primary engineering and the secondary field advisors and the college faculty committee on "Undesignated Degree Programs." This committee has the responsibility for implementing all approved policies pertaining to this program and reviewing and acting on the candidacy forms filed by the student.

Specific University and College academic regulations apply to this undesignated degree program in the same manner as they apply to the conventional designated degree programs. For example, the academic regulations of the University apply as stated in Part 2 of this catalog and the College requirement of 2.00 factor in the major field during the junior and senior years apply. For the purpose of implementation of such academic rules, the credits in the primary engineering field *and* the credits in the secondary field are considered to count as the "major" for such academic purposes.

Environmental Engineering. Environmental engineering is the application of basic engineering and science to the problem of the environment to ensure optimum environmental quality. In recent years, humans have suffered a continually deteriorating environment. A truly professional engineer involved in the study of environmental engineering must see the total picture and relate it to a particular mission whether this be air pollution, water quality control, environmental health or solid and liquid waste disposal. The total picture includes urban systems design, socio-economic factors, water resource

development, and land and resource conservation.

A student who selects the B.S.–Engineering degree program can specialize in environmental engineering by proper selection of primary and secondary fields from the wide selection of courses related to environmental engineering given by the various departments in the College.

Engineering-Medicine. Advanced technology is finding increasingly sophisticated applications in medical care delivery and research. Pacemakers, heart-assist pumps, kidney dialysis machines, and artificial limbs are only a few examples of the role of engineering and technology in medicine. In addition, diagnostic procedures and record-keeping have been greatly enhanced by the use of computers and electronic testing equipment. There is a growing need for physicians and researchers in the life sciences, having strong backgrounds in engineering, who can effectively utilize these technologies and who can work with engineers in research and development.

The Bachelor of Science in Engineering degree provides the student an excellent opportunity to develop a professional level of competence in an engineering discipline while at the same time meeting the entrance requirements for medical school. Under the *applied science* option, the student could select any engineering field of most interest to him/her, and his or her secondary field would usually be chemistry or zoology. In addition to the medical school entrance requirements, he or she would complete 12 credits of advanced work in his or her secondary field.

Under the *engineering* option, the student would generally combine chemical engineering (as either primary or secondary field) with another engineering discipline. This option allows the student to complete more advanced work in his/her primary field of engineering than does the applied science option. Either option can be completed in a four-year period with careful planning and scheduling.

Options of the "B.S.–Engineering" Program. The "B.S.–Engineering" program is designed to serve three primary functions: (1) to prepare those students who wish to use the breadth and depth of their engineering education as a preparatory vehicle for entry into post-baccalaureate study in such fields as medicine, law, or business administration; (2) to provide the basic professional training for those students who wish to continue their engineering studies on the graduate level in one of the new interdisciplinary fields of engineering such as environmental engineering, bio-medical engineering, systems engineering, and many others; and finally (3) to educate those students who do not plan a normal professional career in a designated engineering field but wish to use a broad engineering education so as to be better able to serve in one or more of the many auxiliary or management positions of engineering related industries. The program is designed to give the maximum flexibility for tailoring a program to the specific future career plans of the student. To accomplish these objectives, the program has two optional paths: an engineering option and an applied science option.

The engineering option should be particularly attractive to those students contemplating graduate study or professional employment in the interdisciplinary engineering fields, such as environmental engineering, bio-engineering, bio-medical, and systems and control engineering, or for preparatory entry into a variety of newer or interdisciplinary areas of graduate study. For example, a student contemplating graduate work in environmental engineering might combine chemical and civil engineering for his or her program; a student interested in systems and control engineering graduate work might combine electrical engineering with aerospace, chemical, or mechanical engineering.

The applied science option should be particularly attractive to those students who do not plan on professional engineering careers but wish to use the rational and developmental abilities fostered by an engineering education as a means of furthering career objectives. Graduates of the applied science option may aspire to graduate work and an ultimate career in a field of science, law, medicine, business, or a variety of other attractive opportunities which build on a combination of engineering and a field of science. Entrance requirements for law and medical schools can be met readily under the format of this program. In the applied science program, any field in the University in which the student may earn a B.S. degree is an acceptable secondary science field, thus affording the student a maximum flexibility of choice for personal career planning.

Minimum Requirements. Listed below are the minimum requirements for the B.S.–Engineering degree with either an engineering option or an applied science option. The 66 semester credit hours required for the completion of the junior and senior years are superimposed upon the freshman and sophomore curriculum of the chosen primary field of engineering. The student, thus, does not make a decision whether to take the designated or the undesignated degree in an engineering field until the beginning of the junior year. In fact, the student can probably delay the decision until the spring term of the junior year with little or no sacrifice, thus affording the student ample time for decision. Either program may be taken on the regular four-year format or under the Maryland Plan for Cooperative Engineering Education.

Junior-Senior Requirements for the Degree of B.S.—Engineering

Requirements	*Semester Hours (Engineering Option)*	*Semester Hours (Applied Science Option)*
Univ. Studies Prog. Requirements	15	15
Mathematics, Physical Sci. Requirements[3]	3	3
Engineering Sciences[1,3]	6[2]	6
Primary Field[4]	24 (Engr.)	18 (Engr.)
Secondary Field	12 (Engr.)	12 (Sci.)
Approved Electives[3,6]	6 (Tech.)	9 or 10
Sr. Research/Project		3 or 2
Total	66	66

Engineering fields of concentration available under the B.S.–Engineering program as primary field within either the *engineering* option or the *applied science* option are: aerospace engineering, engineering materials, agricultural engineering, fire protection engineering, chemical engineering, mechanical engineering, civil engineering, nuclear engineering, and electrical engineering.

All engineering fields of concentration may be used as a secondary field within the engineering option.

[1] Engineering sciences, for the purpose of this degree, are those courses in the College of Engineering prefixed by ENES, or, are in an engineering field not the primary or secondary field of engineering concentration.

[2] Students following the engineering option may use up to six semester hours of coursework at the 100 or 200 course number level in the primary or the secondary field of engineering concentration as an engineering science.

[3] A minimum of 50% of the coursework in the mathematics, physical sciences, engineering-science and elective areas must be at the 300 or 400 course number level.

[4] All of the courses used to fulfill the fields of concentration requirements (36 semester hours in the engineering option and 30 in the applied science option) must be at the 300 course number level or above.

[5] For the applied science option each student is required—unless specifically excused, and if excused, 15 semester hours of approved electives will be required—to satisfactorily complete a senior level project or research assignment relating the engineering and science fields of concentration.

[6] In the engineering option, the 6 semester hours of electives must be technical (math, physical sciences, or engineering sciences, but may not be in the primary or secondary fields of concentration). In the applied science option, the approved electives should be selected to strengthen the student's program consistent with career objectives. Courses in the primary or secondary fields of concentration may be used to satisfy the approved electives requirement.

Engineering Materials Program

Director: Arsenault**
Professor: Dieter*
Associate Faculty: Armstrong*
Assistant Professor: Ankem**

* *Member of Mechanical Engineering Department*
** *Member of Chemical and Nuclear Engineering Department*

Materials engineering is the study of the relationship between structure and properties of materials. The principles of physics, chemistry and mathematics are applied to metals, ceramics, and composite materials used in industrial applications. In addition to the traditional area of metallurgy, materials engineering includes the fields of solid state physics and materials science and their application to modern industrial problems. Because of the extensive use of materials, the engineering student finds a wide variety of interesting career opportunities in many companies and laboratories. Materials research is particularly important in the development of new energy-conversion systems.

Programs of study in engineering materials at the undergraduate and graduate level are offered through the chemical and mechanical engineering departments. Students may use engineering materials as a field of concentration in the Bachelor of Science in Engineering Program.

Students choosing materials engineering as their primary field should submit a program for approval during their junior year. The following is an

example of such a program. Students electing materials engineering as their secondary field should seek advice from a member of the materials engineering faculty prior to their sophomore year.

	Semester Credit Hours	
Sophomore Year	*I*	*II*
University Studies Program		3
MATH 241—Analysis III	4	
MATH 246—Differential Equations		3
PHYS 262, 263—General Physics	4	4
ENES 220—Mechanics, Materials	3	
CHEM 233, 243—Organic Chemistry I and II	4	4
ENES 230—Introduction to Materials and their Applications	3	
ENME 205—Engineering Analysis and Computer Prog.		3
Total	17	16

In general, students should not register for 300–400 level engineering subjects until and unless they have satisfactorily completed MATH 241 and 246.

Junior Year		
University Studies Program	3	3
CHEM 481, 482—Physical Chemistry	3	3
ENMA 300—Materials Science and Engineering	3	
ENMA 301—Materials Engineering Laboratory	1	
ENMA 462—Deformation of Engineering Materials	3	
ENMA 463—Chemical, Liquid and Powder Process of Engineering Materials		3
ENMA 464—Environmental Effects on Engineering Materials		3
Minor Courses	3	3
Technical Electives		3
Total	16	18
Senior Year		
University Studies Program	6	6
ENMA 470—Structure and Properties of Engineering Materials	3	
ENMA 471—Phys. Chem. of Engineering Materials	3	
ENMA 472—Technology of Engineering Materials		3
ENMA 473—Processing of Engineering Materials		3
Minor Courses	3	3
Technical Electives		3
Total	15	18

Minimum Degree Credits—120 credits and the fulfillment of all Department, College, Division and University requirements.

Course Code Prefix—ENMA

Nuclear Engineering Program

Professor and Director: Munno
Professor and Chairman: Roush
Professors: Duffey, Hsu, Silverman
Associate Professors: Almenas, Pertmer
Assistant Professor: Modarres
Lecturer: Lee (p t)
Adjunct Professor: Graves

Nuclear engineering deals with the practical use of nuclear energy from nuclear fission, fusion and radioisotope sources. The major use of nuclear energy is in electric power generation. Other uses are in the areas of chemical processing, medicine, instrumentation, and isotope tracer analysis. The nuclear engineer is primarily concerned with the design and operation of energy conversion devices ranging from very large reactors to miniature nuclear batteries, and with the use of nuclear reactions in many environmental, biological and chemical processes. Because of the wide range of uses for nuclear systems, the nuclear engineers find interesting and diverse career opportunities in a variety of companies and laboratories.

Programs of study in nuclear engineering at the undergraduate and graduate level are offered through the Department of Chemical and Nuclear Engineering. Students may use nuclear engineering as a field of concentration in the Bachelor of Science in Engineering program.

Students choosing nuclear engineering as their primary field should submit a program for approval during their junior year. The following is an example of such a program. Students electing nuclear engineering as their secondary field should seek advice from a member of the nuclear engineering faculty prior to their sophomore year.

Sophomore Year	*I*	*II*
University Studies Program Requirements	3	3
MATH 241—Calculus III	4	
MATH 246—Differential Equations		3
PHYS 262, 263—General Physics	4	4
ENES 230—Materials Science	3	
ENES 240—Engineering Computation	3	
Secondary Field Electives		3
ENNU 215—Introduction to Nuclear Technology		3
Total	17	16
Junior Year		
University Studies Program Requirements	3	6
ENNU 440—Nuclear Technology Laboratory	3	
ENNU 450—Nuclear Reactor Engineering I	3	
Math-Physics Science Elective	3	
Secondary Field Courses	3	3
ENNU 455—Nuclear Reactor Engineering II		3
ENNU 460—Nuclear Heat Transport		3
ENMA 464—Environmental Effects on Engineering Materials		3
Total	15	18
Senior Year		
University Studies Program Requirements	3	3
ENNU Electives	3	3
Secondary Field Courses	3	3
Technical Electives	3	3
ENNU 480—Reactor Core Design	3	
ENNU 490—Nuclear Fuel Cycle and Management		3
ENES Elective	3	
Total	18	15

Minimum Degree Credits—120 credits and fulfillment of all Department, College, Division and University requirements.

Course Code Prefix—ENNU

Other Mathematical and Physical Sciences Departments, Programs and Curricula

Applied Mathematics Program

Director: Wolfe
Faculty: One-hundred-sixteen members from thirteen units of the campus

The Applied Mathematics Program is a graduate program in which the students combine studies in mathematics and in application areas. The program is administered by the Applied Mathematics Program and all MAPL courses carry credit in mathematics. An undergraduate program stressing applied mathematics is available to majors in mathematics and such courses occur under the MATH and STAT label as well as the MAPL label. See the Mathematics listing for details.

Course Code Prefix—MAPL

Astronomy Program

Professor and Acting Director: A'Hearn
Professors: Bell, Erickson, Kerr, Papadopoulos, Rose, Wentzel
Professors (Adjunct or part-time): Brandt, Trimble, Westerhout
Associate Professors: Blitz, Eichler, Harrington, Heckman, Matthews, Wilson, Zipoy
Assistant Professor: Hartquist

The Department of Physics and Astronomy offers a major in astronomy. The Astronomy Program office is located in the Computer and Space Sciences Building. Astronomy students are given a strong undergraduate preparation in astronomy, physics and mathematics, as well as encouragement to take a wide range of other liberal arts courses. The Astronomy Program is designed to be quite flexible, in order to take advantage of students' special talents or interests after the basic requirements for a sound astronomy education have been met. Students preparing for graduate studies will have an opportunity to choose from among many advanced courses available in astronomy, mathematics and physics. The program is designed to prepare students for positions in governmental and industrial laboratories and observatories, for graduate work in astronomy or related fields, and for non-astronomical careers such as in law or business.

Astronomy majors are required to take an introductory course in astronomy. This will usually be ASTR 181, 182. However students with the appropriate physics background could take the one semester introductory course, ASTR 350, instead. In addition ASTR 210 (practical astronomy) and two 400 level astronomy courses are required for the major.

Students majoring in astronomy are also required to obtain a good background in physics. The normal required course sequence is PHYS 191, 192, 293 and 294 along with the attendent lab courses 195, 196, 295 and 296. In addition, the student would be required to take PHYS 421–422 or 410–411. Required supporting courses are MATH 140, 141 and 241 or 246.

The program requires that the student maintain an average grade of C in all astronomy courses, moreover, the average grade of all the required physics and mathematics courses must also be C or better. Any student who wishes to be recommended for graduate work in astronomy must maintain a B average. He or she should also consider including several additional advanced courses beyond the minimum required, to be selected from astronomy, physics and mathematics.

Detailed information on typical programs and alternatives to the standard program can be found in the pamphlet entitled "Department Requirements for a B S Degree in Astronomy" which is available from the Astronomy Program office

Note: Some changes in the required program for astronomy majors are under discussion Check with the Astronomy Program office for further details.

Honors in Astronomy. The Honors Program offers students of exceptional ability and interest in astronomy an educational program with a number of special opportunities for learning There are many opportunities for part-time research participation which may develop into full-time summer projects An honors seminar is offered for advanced students, credit may be given for independent work or study, and certain graduate courses are open for credit toward the bachelor's degree

Students for the Honors Program are accepted by the Department's Honors Committee on the basis of recommendations from their advisors and other faculty members Most honors candidates submit a written report on their research project, which together with an oral comprehensive examination in the senior year, concludes the program which may lead to graduation "with honors (or high honors) in astronomy "

Courses for Non-Science Majors. There are a variety of astronomy courses offered for those who are interested in learning about the subject but do not wish to major in it These courses do not require any background in mathematics or physics and are geared especially to the non-science major ASTR 100 is a general survey course that briefly covers all of the major parts of astronomy ASTR 110 is the lab that can be taken with or after ASTR 100. Several 300-level courses are offered primarily for non-science students who want to learn about a particular field in depth Such topics as the Solar System, Galaxies and the Universe, and Life in the Universe are offered.

Course Code Prefix—ASTR

Computer Science

Professor and Chairman: Basili
Professors: Agrawala, Atchison, Edmundson[1], Kanal, Mills, Minker, Rosenfeld[2], Stewart[3], Yeh
Associate Professors: Austing, Davis, Gannon, Knott, Nau, O'Leary, Roussopoulos, Samet, Shneiderman, Tripathi, Weiser, Zelkowitz
Assistant Professors: Amir, Elman, Faloutsos, Fontecilla[3], Furuta Gasarch, Hendler, Jalote, Johnson, Kruskal, Mount, Perlis, Ramakrishnan, Reggia[4], Ricart[2], Sanders, Shankar, Smith, Stotts

[1]*Jointly with Mathematics*
[2]*Jointly with Computer Science Center*
[3]*Jointly with the Institute of Physical Sciences and Technology*
[4]*Jointly with the School of Medicine, UMAB*

The Department of Computer Science offers a B S degree in computer science The program is designed to meet the three broad objectives of service to the community, qualification for employment, and preparation for graduate work It provides the student with the flexibility to select courses in areas of individual interest and in line with the student's goals after graduation.

Selective Admissions Policies.

Freshman: Admission to the major is competitive for incoming freshmen. Applicants who have designated a computer science major will be selected for admission on the basis of academic promise and available space Applicants admissible to the University but not to the major will be offered admission to pre-computer science A pre-computer science major is not assured eventual admission to the major Because of space limitations the University may not be able to offer admission to all qualified applicants The College Park Campus strongly urges early application.

Transfer: Admission to major is competitive for transfer students Applicants who have designated a computer science major will be selected for admission on the basis of academic promise and available space Transfer applicants enrolled prior to May 1984 in a computer science program in a Maryland Community College, in a Northern Virginia Community College, or from the computer science program at The University of Maryland Baltimore County (UMBC) will be offered admission to the major under policies in effect at the time of their initial enrollment in the transfer program at the sending institution. All other transfer applicants must compete for enrollment in the College based upon the criteria in effect for the semester during which the student wishes to enroll. Because of space limitations the University may not be able to offer admission to all qualified applicants. The College Park Campus strongly urges early application.

Courses: All pre-computer science majors must take CMSC 121 and 122 aan MATH 140 and 141 After completing at least 28 credits, with at least a 2 3 GPA in the required courses, pre-majors may apply to be majors Space limitations mean that not all qualified applicants may be admitted to the major. Computer science courses 300-level and above are restricted to majors only

Requirements for a Computer Science Major. The course of study for each computer science major must include all of the following requirements

1. A minimum of 35 credit hours of CMSC courses which satisfy the following conditions
   (a) A grade of C or better must be achieved in each course
   (b) At least 24 credit hours must be at the 300–400 levels including CMSC 311, CMSC 330 and at least 15 credit hours of the following courses 411, 412, 420, 430, 435, 450, 471, one of 424 or 426, one of 450 or 452 one of 460 or 470
2. The mathematics calculus sequence MATH 140, 141 (or MATH 150, 151) and at least two MATH, STAT or MAPL courses which require MATH 141 (or a more advanced mathematics course) as a prerequisite Of the two courses at least one must be a statistics course A grade of C or better must be achieved in each course No course which is crosslisted as CMSC may be counted in the requirement
3. A minimum of 12 credit hours of 300–400 level courses (plus their prerequisites) in one discipline outside of computer science with an average of C or better No course which is crosslisted as CMSC may be counted in this requirement
4. 39 credit hours which satisfy the University Studies Program (USP) as presented under Academic Regulations and Requirements Courses taken to satisfy these requirements may also be used to satisfy major requirements
5. Electives to obtain at least the minimum 120 hours needed for graduation. (Students may wish to choose their electives to satisfy the requirements of another department's degree program, and, by so doing, qualify for a double major)

Introductory Computer Science Courses. The Department offers a choice of courses. CMSC 103, 110, for students with little or no computer background

CMSC 103 is considered a terminal course for liberal arts majors It provides an introduction to the use of a computer and programming in the language FORTRAN

Non-majors (particularly scientists and engineers) who may want to take additional CMSC courses should take CMSC 110 instead of CMSC 103 CMSC 110 permits students to pursue courses conducted in other languages (CMSC 120 in Pascal) as well as numerical analysis courses (CMSC 460, 470, 471). Students who complete CMSC 110 must still take CMSC 121 to become majors Non-majors wishing to take upper-division courses must take CMSC 121–122

Majors should take the CMSC 121, 122 sequence in their first year These courses emphasize the use of formal techniques in computer science: grammars, discrete mathematics, functional semantics, and program correctness.

Undergraduate Computer Science Courses. Beginning with courses at the 200 level each student may arrange an individualized program by choosing areas of interest within computer science and then taking courses appropriate to those areas The Department offers the following undergraduate courses in the areas indicated Computer Systems CMSC 211, 311, 411, 412, 415, Information Processing CMSC 220, 420, 424 426, Numerical Analysis CMSC 460, 470, 471, Programming Languages. CMSC 330, 430, 432, 434, 435; and Theory of Computing CMSC 250, 450, 451, 452, 455

In addition special topics courses (CMSC 498) are offered in one or more areas each semester (Graduate level courses are offered in all of these areas as part of the Department's M S and Ph D degree programs)

The student may choose from a large variety of computer science courses to satisfy the requirement of a minimum of 35 credit hours of CMSC courses A number of advanced courses in computer science have additional mathematics prerequisites such as MATH 240 and 241 Students who anticipate continuing their studies in graduate school should complete the sequence MATH 140, 141, 240, 241, and a statistics course.

Upper-division Courses. Courses numbered 300 and higher are restricted to majors only Selected non-majors may apply to take these courses by going to the Computer Science Education Office.

Sample Program

The following program is appropriate for an incoming student with little or no computer science background and with sufficient mathematics background to begin with MATH 140.

	Semester Credit Hours	
	I	*II*
Year 1		
CMSC 112	4	
CMSC 113		4
CMSC 250		3
MATH 140	4	
MATH 141		4
ENGL 101	3	
Elective	3	3
Total	14	14
Year 2		
CMSC 211	3	
CMSC 220		3
MATH 240	3	
MATH 241		3

Electives	9	9
Total	15	15
Year 3		
CMSC 311	3	
CMSC 330		3
CMSC 420	3	
CMSC 4xx		3
STAT 4xx		3
Electives	9	6
Total	15	15
Year 4		
CMSC 4xx	3	3
CMSC 4xx	3	3
Electives	10	10
Total	16	16

Electives must fulfill both USP and CMSC requirements (see Requirement 3 above)

Honors Program. A departmental honors program has been developed to provide an opportunity for selected undergraduate students in computer science to begin scholarly research by conducting suitable independent study in a direction and at a pace not possible in the customary lecture courses. Students are accepted into the program after their sophomore year based on their overall academic performance in computer science courses taken.

At least one course appropriate for departmental honor students is offered each semester. An honors paper of expository or research nature, representing independent study on the part of the student, under guidance of and certified to by a member of the professorial faculty, must be completed in addition to other departmental requirements.

Computer Equipment. The department maintains a mini-and microcomputer laboratory for instruction and research. The laboratory has several PDP—11 systems connected by high-speed lines to the central Univac computers and a graphics dot-matrix printer. A small shop is well equipped with components and test equipment. The laboratory is used for hands-on experience, particularly in operating system software. The department also has a number of hard-copy and display terminals connected to the Computer Science Center's systems. Several DEC VAX II's are maintained for graduate level research. There are many workstations and personal computers. The Department is on both ARPANET and CSNET.

Course Code Prefix—CMSC

Institute for Physical Science and Technology

Professor and Acting Director: Yorke[1]
Professors: Babuska[1], Benesch, Brush[3], Coplan, Dorfman[4], Faller, Ginter, Hubbard[1], Kellogg[1], Krisher, Liu[1], McIlrath, Newhouse[1], Olver[1], Rosenberg, Sengers, Silverman, Stewart[5], Wilkerson, Wu, Zwanzig
Adjunct Professors: Aziz[6] (p t.), DiMarzio[2] (p t.), Gutman[2] (p t.), Nossal[4]
Associate Professors: Gammon, Johnson[7], Matthews
Assistant Professors: Fontecilla[5], Kirkpatrick[4], Thirumalai[8]
Assistant Research Scientists: Ginter, Hill
Research Associates: Braun, Freund, Galfey, Hu, Niewoudt, Lee, Shaumeyer, Shi, Ueda
Professors Emeriti: Landsberg, Pai

[1]*Joint with Mathematics*
[2]*Joint with Chemical Engineering*
[3]*Joint with History*
[4]*Joint with Physics & Astronomy*
[5]*Joint with Computer Science Department*
[6]*Joint with The University of Maryland Baltimore County*
[7]*Joint with Economics*
[8]*Joint with Chemistry*

The faculty members of the Institute for Physical Science and Technology are engaged in the study of pure and applied science problems that are at the boundaries between those areas served by the academic departments. These interdisciplinary problems afford challenging opportunities for thesis research and classroom instruction. Courses and thesis research guidance by the faculty of the Institute are provided either through the graduate programs in chemical physics and in applied mathematics* or under the auspices of other departments. Students interested in studying with Institute faculty members should direct inquiries to the Director, Institute for Physical Science and Technology, College Park, Maryland 20742.

Current topics of research interest at the institute are: atomic and nuclear physics, optical physics, statistical mechanics of physical and living systems, physics of the upper atmosphere and magnetosphere, fluid dynamics, physical oceanography, various aspects of space and planetary science, theoretical and applied numerical analysis, control theory, epidemiology and biomathematics, chemical processes induced by ionizing radiation, and the history of science. They also include analysis of a number of current problems of interest to society such as mathematical models applied to social phenomena and many diverse efforts in basic mathematics. The Institute administers the Graduate Program in Chemical Physics which provides courses, seminars, and research direction for graduate students in the general area of chemical physics. Further information may be obtained by writing to the Director of the Chemical Physics Program or by telephoning (301) 454–4117.

The Institute sponsors a wide variety of seminars in the various fields of its interest. Principal among these are the general seminars in optical physics, applied mathematics, fluid dynamics, and in atomic and molecular physics. Information about these can be obtained by writing the Director or by calling (301) 454–2636.

Financial support for qualified graduate students is available through research assistantships funded by grants and contracts, and through teaching assistantships in related academic departments.

* See the separate listing for the Applied Mathematics Program

Mathematics

Professor and Chairman: Markley
Professors: W. Adams, Alexander, Antman, Auslander, Babuska***, Benedetto, Berenstein, Chu, J. Cohen, Cook, Cooper, Correl, Douglis, Edmundson*, Ehrlich, Evans, Fey**, Fitzpatrick, Goldberg, Goldhaber, Good, Gray, Greenberg, Grove, Gulick, Heins, Horvath, Hubbard*** Hummel, Johnson, Katok, Kellogg***, Kirwan, Kleppner, Kueker, Lay, Lehner, Lipsman, Liu, Lopez-Escobar, Mikulski, Neri, Neumann, Newhouse***, Olver***, Osborn, Pearl, Reinhart, Rosenberg, Rudolph, Schafer, G. Stewart***, Syski, Wolfe, Wolpert, G. Yang, Yorke***, Zagier, Zalcman, Zedek
Associate Professors: Arnold, Baltman, Berg, Brin, Dancis, Ellis, Green, Hamilton, Helzer, Herb, Kedem, King, Kudla, Owings, Sather, Schneider, Slud, Smith, Sweet, Vogelius, Warner, Washington, Wei, Winkelnkemper
Assistant Professors: J. Adams, Boyle, Currier, Harer, Janssen, Jones, Maddocks, Shepherd
Professors Emeriti: Brace, L. Cohen, Jackson, Stellmacher
Instructors: Alter, Cleary
Administrative Assistant: Sorensen

* *Joint Appointment: Department of Computer Science*
** *Joint Appointment: Department of Curriculum and Instruction*
*** *Joint Appointment: IPST*

The program in mathematics leads to a degree of Bachelor of Science in mathematics and offers students training in mathematics and statistics in preparation for graduate work, teaching and positions in government or industry.

A student intending to major in mathematics should complete the introductory sequence MATH 140, 141, 240, 241 or the corresponding honors sequence MATH 150, 151, 250, 251 and should have an average grade of at least B and no grade less than C in these courses.

Each mathematics major will complete with a grade of C or better the following:

1. CMSC 112–113 or CMSC 110 or ENES 240 or a CMSC course having CMSC 110 or 113 as a prerequisite.
2. MATH 143 or an upper level MATH/MAPL course having CMSC 110 as a prerequisite.
3. Eight MATH/MAPL/STAT courses at the 400 level or above, at least four of which are taken on the College Park Campus.
   The eight courses will include:
   (a) MATH 410–411 (Students successfully completing MATH 250–251 are exempted from MATH 410–411 and receive credit for two upper level courses.)
   (b) One course from among MATH 401, MATH 405, or MAPL 471.
   (c) One course from among MATH 414, MATH 415, MATH 462, MATH 436, or MATH 246. If MATH 246 is chosen, it will not count as one of the 8 upper-level courses.
   (d) The remaining 400 level MATH/MAPL/STAT courses are electives, but cannot include any of the following: MATH 400, 461, 478 through 488, or STAT 464. EDCI 451 may be used to replace one of the four elective upper level mathematics courses.

   Undergraduate Math/Stat Majors with an interest in applied mathematics are permitted with the approval of the Undergraduate Office to substitute *two* courses (with strong mathematics content) from outside the Department of Mathematics for *one* of the four elective upper-level mathematics courses.

   With the approval of an advisor, the qualified student may substitute appropriate 600 or 700 level courses for 400 level mathematics courses.
4. In order to broaden the student's mathematical experience, each Math/Stat major must complete, with a grade of C or better, a course sequence in a supporting area. Other sequences may be considered, on a case-by-case basis, by the Undergraduate Chairman. However, any sequence to be approved which does not appear in this list must make substantial use of mathematics comparable to the sequences on this list.
   (a) *Physics.* One of the following sequences:
   PHYS 161, 262, 263 (or ASTR 181)—engineering sequence
   PHYS 191, 192, 293 (or ASTR 181)—physics major sequence
   PHYS 141, 142, and an upper level course approved by the

Department of Mathematics
(b) ENES 110 PHYS 161 ENES 220
(c) *Computer Science* CMSC 112 113, and any group of three courses (3-credit) from CMSC 211–477 that does *not* include CMSC 250 CMSC 400 or any CMSC courses cross-listed with mathematics The three courses might include
CMSC 211 or 220, 311, 411 or 412 (aimed toward computer systems)
CMSC 220, 420, 424 or 426 (aimed toward information processing)
CMSC 330, 430, 432 or 435 (aimed toward program languages)
CMSC 211 or 220, 311 and 330 (most general CMSC courses)
(d) CHEM 103, 113, 233
(e) *Economics* ECON 201, 203, and two of the following (including one of ECON 405, 406) ECON 402 405, 406, 431, 440, 441
(f) *Business*. ECON 201 or 205 and any three of the following BMGT 220, 221, 340, 431, 434
(For business supporting area, MATH 411 can be replaced by STAT 410, provided one of the following courses is included among the eight 400-level math courses STAT 411, 420, 450, MAPL 477)

Within the Department of Mathematics there are a number of identifiable areas which a student can pursue to suit his/her own goals and interests They are briefly described below Note that they do overlap and that a student need not confine himself/herself to one of them

1 Pure mathematics the courses which clearly belong in this area are MATH 402, 403, 404, 405, 406, 410, 411, 414, 415, 417, 430, 432, 433, 436, 444, 446, 447, 450, STAT 410, 411, 420 Students preparing for graduate school in mathematics should include MATH 403, 405, 410 and 411 in their programs. MATH 463 (or 660) and MATH 432 (or 730) are also desirable. Other courses from the above list and graduate courses are also appropriate.
2 Secondary teaching the following courses are required to teach mathematics at the secondary level MATH 402 or 403, 430, and EDCI 451. (EDCI 451 is acceptable as one of the eight upper level math courses required for a mathematics major) These additional courses are particularly suited for students preparing to teach MATH 406, 444, 463, STAT 400 and 410 EDHD 300, EDPA 301, EDCI 350 or 455, and EDCI 390 are necessary to teach, before registering for these courses, the student must apply for and be admitted to teacher education.
3 Statistics For a student with a B A seeking work requiring some statistical background, the minimal program is STAT 400–401 To work primarily as a statistician, one should combine STAT 400–401 with at least two more statistics courses, most suitably STAT 450 and STAT 440 A stronger sequence is STAT 410, 420, 450 This offers a better understanding and wider knowledge of statistics and is a general purpose program (i e , does not specify one area of application). For economics applications STAT 400, 401, 440, 450, and MAPL 477 should be considered. For operations research MAPL 477 and/or STAT 411 should be added or perhaps substituted for STAT 450. To prepare for graduate work, STAT 410 and 420 give the best background, with STAT 411, 421, 440, 450, and 460 added at some later stage.
4 Computational mathematics: there are a number of math courses which emphasize the computational aspects of mathematics including the use of the computer They are MAPL 460, 470, 471, 477, and MATH 475. Students interested in this area should take CMSC 112, 113 as early as possible, and CMSC 420, 440 are also suggested
5 Applied mathematics the courses which lead most rapidly to applications are the courses listed above in 3 and 4 and MATH 401, 414, 415, 436, 462, 463, 464 A student interested in applied mathematics should obtain, in addition to a solid training in mathematics, a good knowledge of at least one area in which mathematics is currently being applied Concentration in this area is good preparation for employment in government and industry or for graduate study in applied mathematics.

Language. Since most of the non-English mathematical literature is written in French, German or Russian, students intending to continue studying mathematics in graduate school should obtain a reading knowledge of at least one of these languages.

Honors in Mathematics. The Mathematics Honors Program is designed for students showing exceptional ability and interest in mathematics Its aim is to give a student the best possible mathematical education Participants are selected by the Departmental Honors Committee during the first semester of their junior year To graduate with honors in mathematics they must pass a final written and oral comprehensive examination. Six credits of graduate work or three credits in a graduate course and three credits of independent study in mathematics approved by the Honors Committee are also required The rest of the program is flexible. Independent work is encouraged and can be done in place of formal coursework.

The Department also offers a special mathematics departmental honors calculus sequence (MATH 150, 151, 250, 251) for promising freshmen with a strong mathematical background (usually including calculus) Enrollment in the sequence is normally by invitation but any interested student may apply to the Mathematics Departmental Honors Committee for admission.

Participants in the General Honors Program may also enroll in special honors sections of the regular calculus sequence (MATH 140H, 141H, 240H, 241H). They may also enroll in the honors calculus sequence if invited by the Mathematics Departmental Honors Committee However the mathematics departmental honors calculus sequence and the General Honors Program are distinct and enrollment in one does not imply acceptance in the other

Neither honors calculus sequence is prerequisite for participating in the Mathematics Honors Program, and students in these sequences need not be mathematics majors

Pi Mu Epsilon. The local chapter of Pi Mu Epsilon, national honorary mathematics fraternity, meets frequently to discuss mathematical or educational topics of interest to undergraduates. The programs are open to the public

Placement in Mathematics Courses. The Department of Mathematics has a large offering to accommodate a great variety of backgrounds, interests and abilities The Department permits a student to take any course for which he or she has the appropriate background regardless of formal coursework For example, a student with a high school calculus course may be permitted to begin in the middle of the calculus sequence even if he or she does not have advanced standing Students may obtain undergraduate credit for mathematics courses in any of the following ways passing the appropriate CEEB Advanced Placement Examination, passing standardized CLEP examinations, and through the Department's Credit-by-Examination Students are urged to consult with advisors from the Department of Mathematics to assist with proper placements

Statistics and Probability, and Applied Mathematics. Courses in statistics and probability and applied mathematics are offered by the Department of Mathematics These courses are open to non-majors as well as majors, and carry credit in mathematics Students wishing to concentrate in the above may do so by choosing an appropriate program under the Department of Mathematics.

Course Code Prefixes—MATH, STAT, MAPL

Mathematics Education

Students completing an undergraduate major in astronomy, physics, physical sciences, or in math, or who may be enrolled in the College of Education, may prepare to teach astronomy, physics, physical science, or math. Early contact should be made with either Dr John Layman (astronomy, physics, physical sciences) or Dr. James Fey (mathematics).

Meteorology Department

Professor and Chairman: Baer
Professors: Faller[1], Shukla, Thompson, Vernekar
Associate Professors: Ellingson, Pinker, Robock, Rodenhuis
Assistant Professors: Carton, Dickerson, Huffman, Kinter,
Visiting Lecturers: Atlas, Lau
Visiting Professor: Rao

[1]*Institute for Physical Science and Technology*

The Department of Meteorology offers a number of courses of interest to undergraduate students. These courses provide an excellent undergraduate background for those students who wish to do graduate work in the fields of atmospheric and oceanic science, meteorology, air pollution, and other environmental sciences The interdisciplinary nature of studies in meteorology and physical oceanography assures that all science oriented students will gain a broadened view of physical science as a whole, as well as the manner in which the sciences may be applied to understand the behavior of our environment

Undergraduate students interested in pursuing a bachelor's degree program preparatory to further study or work in meteorology are urged to consider the Physical Sciences Program, in which they can specialize in meteorology It is important that students who anticipate this specialization should consult the Physical Sciences Program advisor representing the Department of Meteorology as early as possible in their studies.

Because of its interdisciplinary nature, the study of the atmosphere requires a firm background in the basic sciences and mathematics. To be suitably prepared for 400-level courses in meteorology, the student should have the following background either the physics major series PHYS 191–296 or the series PHYS 161, 262, 263, the mathematics series MATH 140, 141, 240, 241 and either the series CHEM 103, 113 or CHEM 105, 115. See the section on course descriptions for electives in meteorology

Students who may be preparing for graduate education in meteorology are strongly advised to pursue further coursework from among the areas of physics, applied mathematics, chemistry, computer science and statistics to supplement coursework in meteorology With proper counseling from the Department of Meteorology advisor, the student wishing to graduate with an M S degree in meteorology may achieve that goal in five years from the inception of university studies.

Course Code Prefix—METO

Physical Sciences Program

Chairman: Wallace
Astronomy: Matthews
Chemistry: Durso
Computer Science: Atchison
Geology: Stifel
Engineering: Sayre
Mathematics: Good
Meteorology: Robock
Physics: Hornyak

Purpose. This program is suggested for many types of students those whose interests cover a wide range of the physical sciences, those whose interests have not yet centered on any one science, students interested in a career in an interdisciplinary area within the physical sciences, students who seek a broader undergraduate program than is possible in one of the traditional physical sciences; students interested in meteorology; preprofessional students (pre-law, pre-medical), or students whose interests in business, technical writing, advertising or sales require a broad technical background This program can also be useful for those planning science-oriented or technical work in the urban field, some of the urban studies courses should be taken as electives Students contemplating this program as a basis for preparation for secondary school science teaching are advised to consult the Science Teaching Center staff of the College of Education for additional requirements for teacher certification.

The Physical Sciences Program consists of a basic set of courses in physics, chemistry and mathematics, followed by a variety of courses chosen from these and related disciplines astronomy, geology, meteorology, computer science, and the engineering disciplines Emphasis is placed on a broad program as contrasted with a specialized one.

Students are advised by members of the Physical Sciences Committee. This committee is composed of faculty members from each of the represented disciplines and some student representatives. Assignment of advisor depends on the interest of the student, e g , one interested principally in chemistry will be advised by the chemistry member of the committee Students whose interests are too general to classify in this manner will normally be advised by the chairman of the committee.

More detailed information concerning the Physical Sciences Program is available from the MPSE Undergraduate Office, Math Building, Y–2300.

The Curriculum. The basic courses include MATH 140, 141 and one other math course for which MATH 141 is a prerequisite (11 or 12 credits); CHEM 103 and 113, or 105 and 115 (8 credits); PHYS 162, 262, 263 (11 credits); or 141, 142 (8 credits), or 191, 192/293/294, 195, 196, 295, 296 (18 credits), or 221, 222 (10 credits), or PHYS 121, 122 followed by PHYS 262 (12 credits); CMSC 110 or 112 (4 credits)

The choice of the physics sequence depends on the student's future aims and his/her background PHYS 161, 262, 263 is the standard sequence recommended for most physical science majors This sequence will enable the student to continue with intermediate level and advanced courses PHYS 141, 142 is available to students who wish a less extensive background in physics than is represented by PHYS 161–263 or 191–294 Students desiring a strong background in physics are urged to enroll in PHYS 191–294 This is the sequence also used by physics majors and leads directly into the advanced physics courses PHYS 221, 222 is designed for education majors, and therefore is suitable for students thinking in terms of a teaching career PHYS 121, 122 plus 262 is offered as an option only for students who have already taken PHYS 121, 122 and then decide to major in physical sciences This sequence should not be selected by students already in or just starting the program The rationale for requiring PHYS 262 to follow 121, 122 is to ensure that students have some physics with calculus (121, 122 do not have a calculus corequisite).

Beyond these basic courses the student must complete 24 credits at the 300 or 400 level, chosen from any three of the following disciplines chemistry, physics, mathematics (including statistics), astronomy, geology, meteorology, computer science, and one of the engineering disciplines, subject to certain limitations. Students presenting PHYS 294 as part of their basic curriculum may include these credits among the 24 credits The 24 distributive credits must be at the upper level (300–400) and shall be distributed so that at least six credits are earned in each of the three selected areas of concentration A grade of C or better must be earned in all program courses (basic and distributive requirement courses).

Engineering courses used for one of the options must all be from the same department, e g , all must be ENAE courses, or a student may use a combination of courses in ENCH, ENNU and ENMA, which are all offered by Department of Chemical and Nuclear Engineering, courses offered as engineering sciences, ENES, will be considered as a department for these purposes Engineering technology courses (ET prefix) are not applicable for a major in physical sciences

Because of the wide choice and flexibility within the program, students are required to submit for approval a study plan during their junior year, specifying the courses they wish to use in satisfying the requirements of the major

Students who wish to depart from the stipulated curriculum may present their proposed program for approval by the Physical Science Committee An honors program is available to qualified students in their senior year

Certain courses offered in the fields included in the program are not suitable for physical science majors and cannot count as part of the requirements of the program These include any courses corresponding to a lower level than the basic courses specified above (e g , MATH 115), some of the special topics courses designed for non-science students, as well as other courses A complete listing of "excluded" courses is available from the MPSE Division office.

Honors Program. The Physical Sciences Honors program offers students the opportunity for research and independent study Interested students should request details from their advisor.

Physics and Astronomy

Professor and Chairman: Liu
Professor and Acting Director of Astronomy Program: A'Hearn
Associate Professors and Associate Chairmen: Bardasis, Mason
Professors: Alley, Anderson, Banerjee, Bell, Bhagat, Boyd, Brill, C Y Chang, Chant, Chen, Currie, DeSilva, Dorfman, Dragt, Drew, Earl, Erickson, Falk, Ferrell, Glasser, Glick, Gloeckler, Glover III, Gluckstern, Goldenbaum, Greenberg, Griem, Griffin, Holmgren, Hornyak, Howarth, Kerr, Korenman, Layman, Lee, Liu, MacDonald, Misner, Mohaptra, Myers, Oneda, Ott, Papadopoulos, R. L Park, Pati, Prange, Reiser, Richard, Roos, Rose, Snow, Steinberg, Sucher, Toll, Wallace, Weber, Wentzel, Woo, Yodh, Zorn, Zuckerman
Professor (part-time): Z Slawsky
Visiting Professors: Franklin, Goldsmith, Trimble
Adjunct Professors: Boldt, Brandt, Fichtel, McDonald, Ramaty, Teplitz, Westerhout
Associate Professors: C. C Chang, Eichler, Einstein, Ellis, Fivel, Gates, Goodman, Harrington, Hu, Kacser, Kim, Lynn, Mathews, Paik, Skuja, Wang, Wilson, Zipoy
Visiting Associate Professors: Dworzecka, Kozlovsky
Adjunct Associate Professors: Bennett, Dixon, Pechacek
Assistant Professors: Blitz, DasSarma, Hamilton, Hartquist, Hassam, Heckman, Kelly, Kirkpatrick, Siegel, Skard, Talaga, Van Orden, Williams
Lecturers: Boyce, Beach, Carlson, Ionson, Kirshner, Knitfen, Lecar, Nossal, Rapport, Restorff, M. Slawsky, Solow, Stecker, Stern, Swank, Theison

The Physics Program includes a broad range of undergraduate courses designed to satisfy the needs of almost every student, from the advanced physics major to the person taking a single introductory physics course In addition, there are various opportunities for personally directed studies between student and professor, and many undergraduate "research" opportunities also are available For further information consult "Undergraduate Programs in Physics" available from the Department.

Courses for Non-Majors. The department offers several courses which are intended for students other than physics majors PHYS 101, 102, 106, 111 and 112 without a laboratory and PHYS 114 and 117 with laboratory are designed to satisfy the University Studies distribution requirements (PHYS 106 may be taken with the lab PHYS 107 to satisfy the lab requirement) PHYS 121, 122, or 141, 142 satisfy the requirements for professional schools such as medical and dental, and PHYS 161, 262, 263 satisfy the introductory physics requirement for most engineering programs PHYS 318 and 499F are one semester courses stressing contemporary topics for those who have completed a year of one of the above sequences In addition, PHYS 420 is a one semester modern physics course for advanced students in science or engineering Either the course sequence 161, 262, 263, or the full sequence 191, 192 293, 294 is suitable for mathematics students and those who major in other physical sciences.

The Physics Major. The way most physics majors will begin their work is with a two-year basic sequence of physics courses PHYS 191A or B, 192, 293, and 294, accompanied by the laboratory courses PHYS 195, 196 in the first year and 295, 296 in the second year Transfer students who come with a different set of introductory courses either will be put into an appropriate course in this sequence or will take bridging courses, such as PHYS 404, 405, (if offered) and then go on to advanced courses

The requirement for a physics major includes six laboratory courses and PHYS 410, 411, 421 and 422, plus MATH 140, 141, 240, 241 (or 150, 151, 250) and one additional 3 or 4 credit mathematics course Students must have a grade of at least 2.0 (C) in each of the required physics and required supporting mathematics courses After taking the basic sequence, the student will be able to take specialty courses, such as those in nuclear physics or solid-state physics, or courses in related fields which are of particular interest to him or her In addition, a student interested in doing research may choose to do a bachelor's thesis under the direction of a member of the faculty.

Honors in Physics. The Honors Program offers to students of good ability and strong interest in physics a greater flexibility in their academic programs, and a stimulating atmosphere through contacts with other good students and with individual faculty members There are opportunities for part-time research participation which may develop into full-time summer projects An honors seminar is offered for advanced students, credit may be given for independent work or study and certain graduate courses are open for credit toward the bachelor's degree.

Students are accepted by the department's Honors Committee on the basis of recommendations from their advisors and other faculty members

A final written or oral comprehensive examination in the senior year is optional, but those who pass the examination will graduate "with honors in physics."

The Astronomy Major. See page 126 for details

Course Code Prefix—PHYS

Science Communications

The University of Maryland offers several interdisciplinary approaches to the training of science communicators, ranging from specialization in one science or engineering with background in communication to specializing in journalistic communication with background coursework in the sciences. Each of the several program options can be tailored to the needs of individual students.

Undergraduate students interested in science communications can choose from a wide range of possibilities. For example, some may want a career writing about the general happenings of the day in the physical and life sciences, or some students may prefer writing about the span from a pure science to its applied technology. Others may prefer writing about one field—such as agronomy, astronomy, geology—and its impact on society—in ecological problems, space exploration, and plate tectonics.

The following are several approaches. Writing about the *physical sciences:* A recommended approach would be to take the Physical Sciences Program with a minor in journalism. The Physical Sciences Program consists of a basic set of courses in physics, chemistry and mathematics, followed by a variety of courses chosen from these and related disciplines: astronomy, geology, meteorology and computer science.

Writing about the *life sciences:* A recommended approach would be to take the Biological Sciences Program with a minor in journalism. The Biological Sciences Program includes work in botany, entomology, microbiology, and zoology, and introduces the student to the general principles and methods of each of these biological sciences.

Writing about *engineering:* A recommended approach would be to take the B.S.-Engineering Program with a minor in journalism. The B.S.-Engineering Program blends two or three fields of engineering or applied science.

Writing about a *specific field:* A recommended approach would be to take a departmental major in any of the sciences, agriculture, or engineering and a minor in journalism.

Journalism combined with an overview of the sciences: A journalism major could take selected science courses that provide a familarity with scientific thought and application.

Statistics and Probability

Director: P. Smith

The Mathematical Statistics Program offers a wide range of undergraduate courses in applied statistics, mathematical statistics and probability. The program is administered by the Statistics Branch of the Department of Mathematics, and all STAT courses carry credit in mathematics.

An undergraduate program stressing statistics is available to majors in mathematics. See the Department of Mathematics listing for details. Master's and doctoral degrees in statistics are offered by the Mathematical Statistics Program.

Course Code Prefix—STAT

Campus-wide Programs and Certificates

Air Force Aerospace Studies Program (ROTC)

Director: Bruce

The Air Force Reserve Officers Training Corps (ROTC) provides a program for college men and women to earn a commission as a Second Lieutenant in the United States Air Force while completing their University degree requirements.

Two Programs Offered

Four-Year Program. This program is composed of a General Military Course (GMC) and a Professional Officer Course (POC). The first two years (GMC) normally for freshmen and sophomores, give a general introduction to the Air Force and the various career fields. Students enrolled in the GMC program incur *no obligation* and may elect to discontinue the program at any time. The final two years (POC) are concentrated on the development of management skills and study of American Defense Policy. Students must compete for acceptance into the POC and are guaranteed a commission upon successful completion of the program. *All students enrolled in the last two years of the program receive approximately $1,000 annually tax free.*

Students in the four-year program who successfully complete the first two years of the program and are accepted into the POC program must attend four weeks of field training at a designated Air Force base during the summer after completing the sophomore year of college. To enter the AFROTC program, one should inform his or her advisor and register for classes in the same manner as for other courses.

Two-Year Program. This program is normally offered to prospective juniors but may be taken by seniors and graduate students. The academic requirements for this program are identical to the final two years of the four-year program. During the summer preceding entry into the program, all candidates must complete a six-week field training at a designated Air Force base.

The Curriculum

General Military Course (GMC)

Freshman year— ARSC 100 (Fall) and ARSC 101 (Spring). In combination these two courses are designed to introduce the student to the roles of the Department of Defense and the U. S. Air Force in the contemporary world through a study of the total force structure, strategic offensive and defensive forces, general purpose forces, and aerospace support forces. Each one-credit course consists of one hour of academic class and one hour of leadership laboratory each week.

Sophomore year— ARSC 200 (Fall) and ARSC 201 (Spring). These two courses provide a study of air power from balloons and dirigibles through the jet age, an historical review of air power employment in military and nonmilitary operations in support of national objectives; and a look at the evolution of air power concepts and doctrine. Each one-credit course consists of one hour of academic class and one hour of leadership laboratory each week.

Professional Officer Course (POC)

Junior year— ARSC 310 (Fall) and ARSC 311 (Spring). Each of these courses consists of three hours of academic classes and one hour of leadership laboratory each week. Here the student is introduced to concepts and skills required by the successful manager and leader. The curriculum includes individual motivational and behavioral processes, leadership, communication, and group dynamics, providing the foundation for the development of the junior officer's professional skills (officership). Course material on the fundamentals of management emphasizes decision making, the use of analytic aids in planning, organizing, and controlling in a changing environment, as necessary professional concepts. Organizational and personal values (ethics), management of change, organizational power, politics, and managerial strategy and tactics are discussed within the context of the military organization. Actual Air Force case studies are used throughout the course to enhance the learning and communication process. ARSC 310 is an approved course for the University Studies Program.

Senior year— ARSC 320 (Fall) and ARSC 321 (Spring). Each of these courses consists of three hours of academic classes and one hour of leadership laboratory each week. This course is a study of United States National Security Policy which examines the formulation, organization, and implementation of national security; context of national security, evolution of strategy, management of conflict, and civil-military interaction. It also includes blocks of instruction on the military profession, officership, and the military justice system. The course is designed to provide future Air Force officers with a background of United States National Security Policy so they can effectively function in today's Air Force.

All Aerospace Studies Courses are open to any university student for credit whether or not he or she is in the AFROTC Program. Only the AFROTC cadets attend the leadership laboratories.

Scholarships Available. The AFROTC College Scholarship Program provides 8, 7, 6, 5, 4 semester scholarships to students on a competitive basis. Scholarships are currently available in numerous technical fields and are based on merit and not need. Those selected receive full tuition, lab expenses, incidental fees and book allowance plus a non-taxable allowance of $100 monthly. (See AFROTC College Scholarship Program below.)

Flight Instruction Program. Students who qualify to become Air Force pilots receive a free 13 hours flight instruction program. Cadets are instructed by both military and civilian instructors on all phases of flight, ground operations and FAA control regulations. This program gives the student pilot a good start towards obtaining a private license.

Air Force ROTC Nurse Program. Air Force ROTC makes it possible for qualified applicants of nursing schools to enroll in its programs and, upon completion of all academic and licensing requirements, receive a commission as a Second Lieutenant in the United States Air Force Medical Corps.

General Requirements for Acceptance into the POC. The student must complete the General Military Course and a four-week field training session, or the six-week field training session, pass the Air Force Officer Qualification Test, be physically qualified, be in good academic standing and meet age requirements. Successful completion of the Professional Officer Course and a

bachelor's degree (or higher) are prerequisites for a commission as a Second Lieutenant in the United States Air Force. Additional information may be obtained by telephoning the Office of Aerospace Studies. Telephone 454–3242/43.

Endowed and Annual Scholarships and Grants

AFROTC College Scholarship Program

Air Force ROTC College Scholarships are available on a competitive basis to qualified applicants enrolled in the Four and Two Year AFROTC programs. (For a full explanation of Air Force ROTC, see AFROTC under "Financial Aid.") Four through eight semester scholarships are available and are based on merit and not need. These scholarships provide full tuition, laboratory fees, incidental fees, an allowance for textbooks, and a non-taxable allowance of $100 monthly. Any student accepted by The University of Maryland may apply for these scholarships. AFROTC membership is required if one receives an AFROTC scholarship.

Undergraduate Certificates

There are five undergraduate certificates currently available: Afro-American Studies, Applied Social Sciences, East Asian Studies, Liberal Arts in Business, and Women's Studies.

Afro-American Studies Certificate

The Afro-American Studies Certificate program offers the opportunity to gain a concentration in an interdisciplinary package of courses on the black experience. Courses include such disciplines as anthropology, art, literature, history, public policy, and sociology.

Undergraduates in good standing may apply for the program by contacting Dr. Sharon Harley of the Afro-American Studies Program in Room 2169, LeFrak Hall. Students pursuing the certificate must meet the University Studies Program and division requirements.

To receive the Certificate in Afro-American Studies, students must take 21 credit hours stipulated as follows:

(1) Twelve hours of core courses— AASP 100; 200 or 202; AASP 300; and AASP 400 or 401.
(2) Nine hours of electives from 300 or 400 level courses, of which three hours must be taken from courses outside the Afro-American Studies Program and approved by the AASP faculty.
(3) A maximum of three credit hours of special topics or selected topics courses.
(4) A maximum of nine credit hours applied toward a major.
(5) No more than nine credit hours taken at institutions other than UMCP.
(6) A minimum grade of C in each course applied toward the certificate.

Applied Social Science Certificate

The Division of Behavioral and Social Sciences offers a certificate program for those students interested in developing analytic and research skills for use in careers in the public and private sectors. The certificate in applied social science consists of an integrated, interdisciplinary package of courses in research and analytic methods in applied social science which is designed to complement a student's major. Students from any major or Division may pursue this certificate.

To qualify for the certificate, students will be required to complete 21 hours of specified courses which include a general skills core of courses, a course in the ethics of social research, and a structured internship/practicum experience. For further information concerning this new program, contact the Assistant Provost in the Division of Behavioral and Social Sciences, Room 2141, Tydings Hall, 454–5272.

East Asian Studies Certificate

The Undergraduate Certificate in East Asian Studies is a 24-credit course of instruction designed to provide specialized knowledge of the cultures, histories, and contemporary concerns of the peoples of China, Japan, and Korea. It will complement and enrich a student's major. The curriculum focuses on language instruction, civilization courses, and electives in several departments and programs of the University. It is designed specifically for students who wish to expand their knowledge of East Asia and demonstrate to prospective employers, the public, and graduate and professional schools a special competence and set of skills in East Asian affairs.

Upon satisfactory completion of the courses, with a grade of C or better in each course, and recommendation by the Chairperson of the Committee on East Asian Studies, a certificate will be awarded. A notation of the award of the certificate will be included on the student's transcript. The student must have a baccalaureate degree awarded previous to or simultaneously with an award of the certificate.

Certificate Requirements

Core Courses. The student is required to take:

1. HIST 284—East Asian Civilization I
2. HIST 285—East Asian Civilization II
3. Six semester hours of introduction to one of the following East Asian languages (Chinese, Japanese, or Korean):
   CHIN101—Elementary Chinese I
   JAPN 101—Elementary Japanese I
   Both FOLA 109—Elementary Korean II
   and FOLA 118K—Intermediate Korean I

Students with language competence equivalent to these language courses are exempted from the language requirement, such students are required to complete an additional six hours of electives in East Asian courses to fulfill the 24-credit requirement for the certificate.

Electives. Students must complete at least 12 hours of electives selected from four regular formally approved courses on East Asia in at least two of the following categories: (1) art history, (2) geography, (3) government and politics, (4) history, (5) language, linguistics, and literature, (6) music, (7) sociology, and (8) urban studies. Nine of the twelve hours of electives must be upper division (300–400 level) courses. A maximum of three credit hours of special topics courses on East Asian will be allowed with the approval of the student's certificate adviser. No more than nine credits from any one department may be applied toward the certificate. No more than nine credits applied to the student's major may also apply to the certificate. In addition, no more than nine credits of the courses applied toward the certificate may be transferred from other institutions. Students are asked to work with their advisor in ensuring that the electives maintain an intercollegiate and interdisciplinary focus (at least three disciplines are recommended).

Interested students should contact either Dr. Kenneth Folsom or Dr. Marlene Mayo, Department of History, 2101 Francis Scott Key Hall, (301) 454–2843.

Liberal Arts in Business Certificate

The Division of Arts and Humanities offers an interdisciplinary certificate program, the Liberal Arts in Business, for students pursuing any of the traditional majors within the Division. Any student in the Division of Arts and Humanities may apply for admission to this program which is designed to provide the student with an understanding of the world of business and an awareness of some of the skills needed to compete successfully for entry-level employment in the business world. The core of LAB courses includes special sections of required speech and writing courses, some courses designed especially for the LAB program, Work, Workers, Work Settings (SOCY), The Law and Ethics of Business (BMGT), and Integrated Accounting Budgeting and Planning (BMGT), and some courses open to all students, Economics of Social Problems, Modern Business History. For further information contact the office of the Provost of Arts and Humanities.

Women's Studies Certificate

The Women's Studies Certificate Program consists of an integrated, interdisciplinary package of courses on women and sex roles which is designed to supplement a student's major. Any student in good standing in a division of the University may enroll in the certificate program by declaring her/his intention to the Women's Studies undergraduate advisor. It is suggested that students meet with the advisor in order to plan individual programs. The requirements for the Women's Studies Certificate are under review, and may be revised by Fall, 1986. For additional information, contact the Women's Studies Office, 454–3841.

To qualify for a certificate in Women's Studies a student is required to earn twenty-one credits in required Women's Studies core courses and electives, chosen according to the student's interests. Each student must obtain a grade of C or better in each course that is to be counted toward the certificate.

Each student is required to take *either* WMST 200— Women in Contemporary Society or WMST 400—Theories of Feminism and at least one course from three of the following four categories:

1. ECON 374 Sex Roles in Economic Life
   GVPT 471 Women and Politics
   GVPT 436 Legal Status of Women
2. ENGL 250 Women in Literature
   ENGL 348 Literary Works by Women
3. HIST 210 American Women to 1880
   HIST 211 American Women 1880 to the Present
   HIST 301 Women and Industrial Development
4. SOCY 325 Sex Roles (primarily for non-Sociology majors)
   SOCY 425 Sex Roles and Social Institutions (primarily for Sociology majors)
   PSYC 309 Special Topics Psychology of Women

Students are encouraged to take WMST 200 when possible before enrolling in other courses on women.

The remaining three courses may be chosen from the above list or from the other courses offered within the Women's Studies Program. At least one of the courses must be an upper division course (300–400 level). No more than nine credits from any one department may be applied toward the certificate, and no more than twelve credits may be transferred from other universities and then only with the consent of the Director.

Internships. Women's Studies internships are available to certificate students and any other interested students. The internship courses include individually designed learning projects and a weekly seminar. Together these focus on integrating feminist theory into our understanding of the workplace and sharing personal work experiences in order to increase effectiveness.

The internship program enables students to gain practical experience by working as interns for businesses, agencies, and organizations that provide services for women. The training gained in this process often helps the student clarify goals and discover new employment opportunities.

Course Code Prefix: WMST

Bachelor of General Studies

Administrative Dean for Undergraduate Studies: Shoenberg

The Bachelor of General Studies program is a flexible major which provides an alternative educational structure for students who choose not to concentrate in a specific discipline or department. Students may utilize a wide range of courses offered at UMCP to pursue their own educational objectives, whether by combining related courses from several departments, by exploring two or three distinctly separate interests at once, or by thoughtfully choosing a variety of courses from throughout the University.

Students in General Studies accept responsibility for developing programs to meet their specific educational and employment goals. Although there are no required major courses as in other departments, the substance of the individualized curriculum (the actual courses taken, how they relate to each other, what skills are acquired) may be important to potential employers or for graduate programs.

Requirements

1. The student must be registered as a General Studies major for at least the last 30 credits immediately preceding graduation.
2. A minimum of 120 credits must be accumulated with a cumulative grade point average of at least 2.0.
3. No more than 30 credits in any one department may be applied toward the required 120 credits.
4. No more than 60 credits in any one academic division may be counted toward the required 120 credits.
5. At least 45 credits must be taken at the upper level (courses numbered 300 or higher), a 2.0 cumulative grade point average must be obtained in all upper level courses.
6. Students entering UMCP beginning in May, 1980, with eight or fewer transfer credits, must complete all University Studies requirements.
7. The BGS program may not be used as part of a double major or double degree program.

General Studies is not the same as "Undecided", nor is it usually an appropriate major for freshmen or students in between majors. It is sometimes an excellent choice for entering transfer students with an assortment of past credits in various fields or for people changing from one area of interest to another which is substantially different. In any case, change to the BGS program when you know that it is what you want, it *is* a decision—not a way to avoid one.

For more information, call or visit the office of the Dean for Undergraduate Studies (454–2530, Room 1115, Hornbake Library). Individual advising is available and strongly recommended.

Individual Studies Program

The Individual Studies Program provides an opportunity for students to create and complete individualized majors. To be accepted into the program, a student must:

1) have a clearly-defined academic goal which cannot reasonably be satisfied in an existing curriculum at College Park, and
2) Be able to design, with faculty assistance, a sequence of courses and other learning experiences which is judged to have adequate substance for the awarding of a degree in the specific field of study.

Most IVSP majors are either a form of "area study" utilizing offerings from many departments or a clear combination of two disciplines. Many include internships or independent study projects in the program. All work is done under the supervision of a faculty advisor.

Applicants are required to write a detailed prospectus outlining their proposed program of study. They must meet the General University Requirements or University Studies Requirements according to year of entry. The process of applying often involves considerable consultation and several drafts of a prospectus, so it should be begun as early as possible. Students may be admitted to the Individual Studies Program after completion of 30 college credits and must be officially approved by the Individual Studies Faculty Review Committee prior to the final 30 semester hours of the proposed curriculum.

More information on requirements and procedures is available from the Office of the Dean for Undergraduate Studies, Room 1115, Hornbake Library. After reading that material, arrange a meeting with the Assistant Dean for Undergraduate Studies to informally discuss ideas and plan the next steps.

Study Abroad Programs

The goal of the Study Abroad Office is to enable students to incorporate a summer, semester or year abroad into their degree program at Maryland. Study abroad increases awareness of other cultures and languages while providing a comparative international perspective. Many students find study abroad essential for their major or career plans. Others view it as part of their liberal arts education.

Advising and Information. The Study Abroad Office provides handouts and advising on the wide variety of programs available. A small library provides information on programs offered by other universities. The Office assists students in obtaining credit for their experience abroad.

Maryland Study Abroad Semester/Year Programs

Denmark's International Study Program. Maryland acts as a coordinator for DIS in Copenhagen, which offers many liberal arts subjects taught in English.

Semester in Israel. From February to June students learn Hebrew and take courses in Jewish and Israeli studies taught in English by faculty members at Tel Aviv University.

Study in London offers courses in the social sciences, business and the humanities that focus on Britain.

Study in Beijing offers a spring semester of intensive Chinese language from beginner to advanced level.

Study in Brazil offers a summer and fall semester at the Catholic University of Rio to take regular university courses offered in Portuguese.

Summer Programs

Architecture Abroad. TheSchool of Architecture sponsors a six-week program in Western Europe and a program in Sri Lanka which allow students at an advanced undergraduate and graduate level to deal creatively with architectural issues in a foreign environment.

Summer in Kassel. The Department of Germanic and Slavic Languages and Literature sponsors a five-week intensive language and culture program in Kassel, West Germany.

Exchanges. The Study Abroad Office administers reciprocal exchanges with specific universities overseas. These exchanges are often related to academic departments and require extensive language or academic background. All the exchanges require at least a 3.0 grade point average. Exchanges are available with the University of Kent in Canterbury, England in government and politics, the University of Lancaster, England in mathematics; Keio University in Tokyo, Japan in intensive Japanese, and the University of Bremen, the Free University of Berlin and the Gesamthochschule Kassel in West Germany.

The Study Abroad Office is in Room 1113, North Administration Building. Telephone: 454–8645.

General Honors Program

Director: Howarth

The General Honors Program is designed to allow energetic, academically talented students to pursue their general education at a challenging, stimulating level. Students can engage, with others of similar ability and varied interests, in a program whose emphasis is on interdisciplinary and educationally broadening activity.

Students may apply for admission as freshmen. High school students ordinarily apply at the same time as they apply for admission to the University, although a separate application form is required for General Honors. Undergraduates already on campus, majoring in any department, college or division, and transfer students with distinguished records from other institutions (especially if they come from other Honors Programs) are also encouraged to apply. Selection is made on the basis of academic records, recommendations, standardized test scores, personal achievement, and other evidences of motivation and ability.

Members of the Program may enroll in a variety of kinds of courses, including special introductory colloquia, special honors sections of basic courses in many departments, upper division General Honors seminars, independent study and field experience. Honors Learning Communities allow students to integrate the content of a number of departmental courses around an important common theme. Successful General Honors students graduate with a citation in General Honors which is recorded on their transcripts and diplomas. There is an extensive extra-curricular program of activities, and student participation in decision-making and administration is an important aspect of the program. The General Honors Program is a member of the National Collegiate Honors Council, the Northeast Region of the National Collegiate Honors Council, and the Maryland Collegiate Honors Council. Students and faculty participate regularly in the activities of these organizations. The Program participates in a program of student exchanges with Honors Programs in other institutions.

The College Park Campus also has over 30 Departmental Honors Programs designed to give students the opportunity to pursue more deeply

their studies in their chosen fields of concentration. These programs usually begin in the junior year, though a few (botany, English, history, mathematics, psychology) may start earlier. Some students who enter the General Honors Program as freshmen transfer to their departmental programs in their sophomore or junior years. For information, see the descriptions under the various departmental entries in this catalog, or contact the department.

For application forms and information about the General Honors Program, write to Dr. John Howarth, Director, General Honors Program, The University of Maryland, College Park, MD 20742. Telephone: (301) 454–2532.

Preprofessional Programs

The preprofessional programs are designed to provide the necessary academic foundation required for entrance into professional schools. Some require two or three years of preprofessional study before admission to professional school. Others, such as the programs for pre-dentistry, pre-law, and pre-medicine, normally require completion of a bachelor's degree. Five of these preprofessional programs may be declared as the official undergraduate academic major: pre-dental hygiene, pre-medical technology, pre-nursing, pre-pharmacy, and pre-physical therapy.

In contrast, six of these preprofessional programs are advisory *only*, and cannot be declared as the official undergraduate academic major: pre-dentistry, pre-law, pre-medicine, pre-optometry, pre-osteopathy, and pre-podiatry. The students interested in one of these types of preprofessional preparation may choose from a wide variety of academic majors across campus. The preprofessional advisor will provide guidance concerning the choice of major.

Successful completion of a preprofessional program at the College Park Campus does not guarantee admission to any professional school. Each professional school has its own admissions requirements and criteria, which may include grade point average in undergraduate courses, scores in aptitude tests (Medical College Admission Test, Law School Admission Test, Dental Aptitude Test, Allied Health Professions Admission Test, etc.), a personal interview, faculty recommendations and an evaluation from the preprofessional advisor. admissions requirements, the student is urged to study the catalog of each professional school.

Although completion of the bachelor's degree is a normal prerequisite for admission for dental, law and medical schools, three professional schools of The University of Maryland at Baltimore—Dentistry, Law and Medicine—have arrangements whereby a student who meets certain stringent requirements may be accepted for professional school after three years of undergraduate study (90 credit hours). For students to be eligible for the "combined degree", the final 30 credit hours prior to entry into the Schools of Dentistry, Law, and Medicine (i.e., the junior year) must be taken in residence at the College Park Campus. After the successful completion of an additional thirty hours of work in professional school, the student may apply for the bachelor's degree to be awarded by the College Park Campus.

Because of the competitive nature of professional school admissions, preprofessional students should consider applying to more than one school and should also give some thought to alternative careers. The degree to which this is necessary varies with the program in which one is enrolled. It is helpful to discuss this with the preprofessional advisor.

The Health Professions Advising Office (Room 3103, Turner Laboratory) offers advising and information on preprofessional programs in the health sciences. Reading material on health careers, options, and alternatives is available in the Reading Room of the Health Professions Advising Office. Catalogs from many of the professional schools across the country are available. The Reading Room is open to all interested students and others seeking guidance about health careers.

Pre-Dental Hygiene

Advisor: Stewart

College Park students may prepare themselves not only for entrance into the UMAB Dental Hygiene Program but also for entrance into dental hygiene programs at other colleges and universities. To do this efficiently, students should obtain program information when first entering college so that requirements can be taken in normal sequence. Information for The University of Maryland Dental Hygiene Program is available at the Health Professions Advising Office, Room 3103, Turner Laboratory. Bulletins from other colleges may be available at the same location, or they may be obtained individually.

The Dental School of The University of Maryland, located in Baltimore (UMAB), offers a baccalaureate degree program in dental hygiene, as well as a post-certificate program for registered dental hygienists who have completed a two-year accredited dental hygiene program and are interested in completing the requirements for a baccalaureate degree. Completion of a two-year preprofessional curriculum at any University of Maryland campus except UMAB or at another accredited institution is required for eligibility to apply for admission as a junior in the Dental School at UMAB.

For registered dental hygienists, completion of a two-year accredited dental hygiene program, completion of all required preprofessional courses, and a minimum of one year of clinical experience as a dental hygienist are required for eligibility to apply for admission to the Dental School at UMAB.

The following courses are required for admission to the UMAB Dental Hygiene Program. Course requirements for other dental hygiene programs can be found in the respective college catalogs.

	Semester Credit Hours
Freshman Year	
ENGL 101	3
ZOOL 101	4
CHEM 103 and 104	4, 4
PSYC 100	3
SOCY 100 or SOCY 105	3
MATH 110 or 115	3
Humanities	3
Elective	3
Sophomore Year	
ZOOL 201 and 202	4, 4
MICB 200	4
NUTR 200	3
ENGL 278C	3
Social Sciences	6
SPCH 100 or 107	3
STAT 100 (check math prerequisites)	3
	60

Although courses may be interchanged during the first two years, it is required that chemistry precede microbiology and nutrition to enable its application to these two subjects. It should be noted that Zoology 101 is a prerequisite for Zoology 201, 202 (Human Anatomy and Physiology) at the College Park Campus.

Application and Admission

High school students who wish to enroll in the pre-dental hygiene curriculum at the College Park Campus should request applications directly from the Admissions Office of The University of Maryland, College Park, Md. 20742. It is recommended that those preparing for a baccalaureate degree program in dental hygiene pursue an academic program in high school which includes biology, chemistry, math and physics.

Pre-dental hygiene students should begin the application process for professional school in fall of the sophomore year. UMAB applications and instructions are available in the Health Professions Advising Office. Applications for other programs must be obtained individually from the respective colleges.

Enrollment as a pre-dental hygiene student or as a registered dental hygienist at any campus does not guarantee admission to the Dental Hygiene Program on the Baltimore City Campus (UMAB) or to any other dental hygiene program.

Further Information. At College Park contact the Dental Hygiene Advisor, Room 3103, Turner Laboratory, The University of Maryland, College Park, Maryland. Telephone (301) 454–2540. In Baltimore contact the Dental Hygiene Department, The University of Maryland at Baltimore, 666 W. Baltimore Street, Baltimore, Maryland 21201. Telephone (301)528–7773.

Pre-Dentistry

Advisor: Love

The preprofessional program for pre-dental students is a program of advising for students preparing to apply to dental school. The advice is based on requirements and recommendations of American dental schools and the requirements for a baccalaureate degree on the College Park Campus.

The recommendations made during advising are meant to prepare the student to take the Dental Admissions Test (DAT) in the spring of the junior year. Application to dental school is made during the summer-fall of the senior year. In addition to faculty letters of recommendation, most admissions committees request or require an evaluation from the student's pre-dental advisor. It is important, therefore, for the student to contact the pre-dental advisor early in the academic career and to become familiar with the proper procedures necessary in the evaluation and application process.

For more information on the pre-dental advising program, contact the Pre-dental Advisor, Room 3103, Turner Laboratory, The University of Maryland, College Park, MD 20742. Telephone (301) 454–2540.

There are two ways to prepare for admission to dental school, a four-year program is preferable, but a three-year program is possible.

Four-Year Baccalaureate Program. Most pre-dental students on the College Park Campus complete a four-year undergraduate degree prior to entrance into dental school. Since there is no required, fixed "pre-dent" curriculum, the pre-dental student must choose an academic major from the variety of approved campus programs in the arts, humanities, behavioral and social sciences, mathematics, or physical and life sciences. No specific major is required, favored or preferred by dental school admissions committees.

The four-year student will plan an undergraduate experience which includes courses to satisfy major and supporting area requirements, University Studies Program requirements, and the dental school admission requirements. The student's academic advisor will advise about the first two topics, while the Pre-dental Advisor will advise about dental school admission requirements.

Although specific admission requirements vary somewhat from dental school to dental school, the undergraduate courses which constitute the basic

admission requirements and which prepare the student for the DAT are the following

	Semester Hours
ENGL 101, 391/393—English Composition	3, 3
CHEM 103, 113—General Chemistry I, II	4, 4
CHEM 233, 243—Organic Chemistry I, II	4, 4
PHYS 121, 122 or PHYS 141, 142—Physics	4, 4
MATH 220, 221 or MATH 140, 141—Calculus* 4, 4	3, 3 or
Biology, minimum** (Recommended courses include MICB 200, MICB 380, ZOOL 211, ZOOL 213 or ZOOL 422)	8

* Although calculus is not an entrance requirement of many dental schools and is not included in the DAT, one year of calculus is strongly recommended for the preprofessional student.

** Although the minimum biology requirement is 8 credits the successful applicant will have more, including advanced training in biological sciences at the 300–400 level BOTN 100, BIOL 101 and 124, and MICB 100 are not recommended to meet this requirement

Three-Year Arts-Dentistry Degree Program. Students whose performance during the first two years is exceptional may apply to The University of Maryland School of Dentistry at the beginning of their third year, for entry after three years of college work By the end of the third year the student must have earned 90 academic credits, exclusive of physical education, the last 30 of which must have been earned at The University of Maryland College Park. The undergraduate major is "arts-dentistry" for this program, the work of the first year in the School of Dentistry is considered as the major Within the 90 credits the student must have completed all the requirements listed below

	Semester Credit Hours
A University Studies Program Requirements	30
B Chemistry (inorganic and organic) CHEM 103, 113, 233, 243 or CHEM 105, 115, 235, 245	16
C Biological Sciences	19–20
ZOOL 210—Animal Diversity	
ZOOL 211—Cell Biology and Physiology	
MICB 200—General Microbiology	
Either ZOOL 213 or MICB 380	
One of the following	
ZOOL 411—Cell Biology	
ZOOL 422—Vertebrate Physiology	
ZOOL 430—Vertebrate Embryology	
ZOOL 495—Mammalian Histology	
MICB 360—Medical Virology	
MICB 440—Pathogenic Microbiology	
MICB 450—Immunology	
D Mathematics MATH 220, 221 or MATH 140, 141	6–8
E Physics 121, 122, or 141, 142	8
F Additional upper-level courses from any one of the following combinations:	7–10
1. Zoology—seven hours on the 300–400 level including one laboratory course	
2. Microbiology—seven hours on the 300–400 level including one laboratory course	
3 CHEM 321—Quantitative Analysis plus any three-credit course at the 300–400 level in the physical or biological sciences which is approved by the Pre-Dental Advisor.	
4 BCHM 461, 462, 463, and 464	
5 Nine hours on the 300–400 level in any one department of the Division of Arts and Humanities or the Division of Behavioral and Social Sciences	
G Electives as needed to total at least 90 credits	0–4
Total	90–92

Incoming freshmen interested in this three-year program are strongly urged to consult the Pre-dental Advisor before registration for the first semester at College Park

Students accepted in the combined Arts-Dentistry program may receive the B S degree (Arts-Dentistry) after satisfactory completion of the first year at The University of Maryland Dental School upon recommendation by the Dean of the Dental School and approval by the College Park Campus, the degree to be awarded in August following the first year of Dental School The courses of the first year of Dental School constitute the major, the College Park courses listed above constitute the supporting area

Participation in the three-year program in no way guarantees admission to The University of Maryland Dental School. Three-year students compete with the four-year students for admission.

Pre-Forestry

Pre-Forestry students are advised in the Department of Horticulture See page 62 for information about this program.

Pre-Law

Advisor. Buhlig

Although some law schools will consider only applicants with a B A or B S degree, others will accept applicants who have successfully completed a three-year program of academic work Most law schools do not prescribe specific courses which a student must present for admission, but do require that the student follow one of the standard programs offered by the undergraduate college Many law schools require that the applicant take the Law School Admission Test, preferably in July or October of the academic year preceding entry into professional school

Four-Year Program. The student who plans to complete the requirements for the B A or B S degree before entering law school should select a major field of concentration Most law schools do not prescribe specific majors or courses which must be presented for admission, but do require that one of the standard programs offered by the undergraduate college be followed A student's choices can be guided by the need to develop some of the essential skills needed for the law profession, namely clear and imaginative thinking, accurate and perceptive reading, and literate expression.

Three-Year Arts-Law Program. Although some law schools will consider only applicants with a B A or B S degree, others will accept applicants who have successfully completed a three-year program of academic work Students planning to enter law school at the end of the third year should complete the University Studies Program Requirements By the end of the junior year, the student will complete the requirements for a "minor" (18 semester hours in one department, 6 hours being at the 300–400 level) The program during the first three years should include all of the basic courses required for a degree (including the 18-hour "minor" course program) and all University requirements The academic courses must total 90 hours, and must be passed with a minimum average of 2 0 To be acceptable to law schools, however, students in virtually all cases must have a considerably higher average

Students with exceptional records who are accepted to the School of Law of The University of Maryland under the arts-law program may receive a B A degree (arts-law) after satisfactory completion of the first year of law school, upon recommendation by the Dean of The University of Maryland Law School and approval by the College Park Campus The degree is awarded in August following the first year of law school (or after 30 credit hours are completed)

For additional information, contact the Pre-law Advisor, Room 1117, Hornbake Library, The University of Maryland, College Park, MD 20742. Telephone. (301) 454–3040.

Pre-Medical Technology

Advisor: Stewart

College Park students may prepare themselves not only for entrance into the UMAB Medical Technology Program but also for entrance into medical technology programs at other colleges and universities To do this efficiently, students should obtain program information when first entering college so that requirements can be taken in normal sequence Information for The University of Maryland Medical Technology Program is available at the Health Professions Advising Office, Room 3103, Turner Laboratory Bulletins from other colleges may be available at the same location, or they may be obtained individually

A Bachelor of Science degree in Medical Technology is offered through the Medical Technology Program of The University of Maryland Medical School, located in Baltimore (UMAB) The first two years, consisting of preprofessional studies, may be completed on any University of Maryland campus, except UMAB, or at any regionally accredited university or college

The medical technologist plays a major role in the diagnosis and treatment of disease by applying scientific knowledge and skill to the supervision and accurate performance of complex laboratory and therapeutic procedures. Career opportunities exist for the medical technologist in hospitals, private clinics, pharmaceutical research, government, academics and sales The professional curriculum at UMAB includes courses in hematology, clinical chemistry, microbiology, immunology, immunohematology, microscopy, anatomy and physiology, and management The curriculum at UMAB is designed to train students in the complex technical skills essential for the modern medical technologist, as well as to challenge students to understand the more complex principles underlying their technology It is essential that students develop skills in the area of oral and written communication and the critical assessment of information.

Application and Admission. *High school students* who wish to enroll in the pre-medical technology curriculum at College Park must meet admission requirements of that campus High school students are encouraged to enroll in a college preparatory curriculum emphasizing biology, chemistry and college preparatory mathematics

Pre-medical technology students should begin the application process for professional school in fall of the sophomore year UMAB applications and instructions are available in the Health Professions Advising Office.

Applications for other programs must be obtained individually from the respective colleges.

Enrollment as a pre-medical technology student at any campus does not guarantee admission to the Medical Technology Program on the Baltimore City Campus (UMAB) or to any other medical technology program.

The following courses are required for admission to the UMAB Medical Technology Program. Course requirements for other medical technology programs can be found in the respective college catalogs.

	Semester Credit Hours
Chemistry 103, 113	4, 4
Chemistry 233, 243	4, 4
Zoology 101	4
Microbiology 200	4
Mathematics 110, 111 or above	3, 3
English 101, and Literature	3, 3
Speech 107 or 100	3
Humanities (History, literature, philosophy, appreciation of Art, Music, Drama, Dance)	3
Behavioral and Social Sciences (Anthropology, Economics, Government & Politics, Geography, Psychology, Sociology)	6
Electives *	12
Total Semester Hours	60

* Recommended electives include statistics, computer science and biochemistry.

Further Information. At College Park, contact the Medical Technology Advisor, The University of Maryland, Room 3103, Turner Laboratory, College Park, MD 20742. Telephone (301)454–2540. In Baltimore, contact the Medical Technology Program, The University of Maryland, Allied Health Professions Building, 32 S. Greene Street, Baltimore, Maryland 21201. Telephone (301) 528–7664.

Pre-Medicine

Advisor: Love

The preprofessional program for pre-medical students is a program of advising for students preparing to apply to medical school. The advice is based on requirements and recommendations of American medical schools and the requirements for a baccalaureate degree on the College Park Campus. The pre-medical advisor in the Health Professions Advising Office is prepared to assist students in setting career objectives, selecting undergraduate coursework to meet the admissions criteria of the professional schools, and in all phases of the application process itself.

The recommendations made during advising are meant to prepare the student to take the Medical College Admission Test (MCAT) in the spring of the junior year. Application to medical school is made during the summer-fall of the senior year. Medical admissions committees generally request or require an evaluation from the student's pre-medical advisor. It is important, therefore, for the student to contact the pre-medical advisor early in the academic career and to become familiar with the proper procedures necessary in the evaluation and application process.

For more information on the pre-medical advising program, contact the Pre-medical Advisor, Room 3103, Turner Laboratory, The University of Maryland, College Park, MD 20742. Telephone (301) 454–2540.

There are two ways to prepare for admission to medical school; a four-year program is preferable, but a three-year program is possible.

Four-Year Baccalaureate Program. Most pre-medical students on the College Park Campus complete a four-year undergraduate degree prior to entrance into medical school. Since there is no required, fixed "pre-med" curriculum, the pre-medical student must choose an academic major from the variety of approved campus programs in the arts, humanities, behavioral and social sciences, mathematics, or physical and life sciences. No specific major is required, favored or preferred by medical school admissions committees.

The four-year student will plan an undergraduate experience which includes courses to satisfy major and supporting area requirements, University Studies Program requirements, and the medical school admission requirements. The student's academic advisor will advise about the first two topics, while the Pre-medical Advisor will advise about medical school admission requirements.

Although specific admission requirements vary somewhat from medical school to medical school, the undergraduate courses which constitute the basic admission requirements and which prepare the student for the MCAT are the following:

	Semester Credit Hours
ENGL 101, 391/393—English Composition	3, 3
CHEM 103, 113—General Chemistry I, II	4, 4
CHEM 233, 243—Organic Chemistry I, II	4, 4
PHYS 121, 122, or PHYS 141, 142—Physics	4, 4
MATH 220, 221, or MATH 140, 141—Calculus*	3, 3 or 4, 4
Biology, minimum** (Recommended courses include MICB 200, MICB 380, ZOOL 211, ZOOL 213 or ZOOL 422)	8

* Although calculus is not an entrance requirement of many medical schools and is not included in the MCAT, one year of calculus is strongly recommended for the preprofessional student.

** Although the minimum biology requirement is 8 credits, the successful applicant will have more, including advanced training in biological sciences at the 300–400 level. BOTN 100, BIOL 101 and 124, and MICB 100 are not recommended to meet this requirement.

Three-Year Arts-Medicine Degree Program. Students whose performance during the first two years is exceptional may apply to The University of Maryland School of Medicine at the beginning of their third year, for entry after three years of college work. By the end of the third year the student must have earned 90 academic credits, exclusive of physical education, the last 30 of which must have been earned at The University of Maryland College Park. The undergraduate major is "arts-medicine" for this program, the work of the first year in the School of Medicine is considered as the major. Within the 90 credits the student must have completed all the requirements listed below:

	Semester Credit Hours
A. University Studies Program Requirements	30
B. Chemistry (inorganic and organic) CHEM 103, 113, 233, 243 or CHEM 105, 115, 235, 245	16
C. Biological Sciences ZOOL 210—Animal Diversity ZOOL 211—Cell Biology and Physiology MICB 200—General Microbiology Either ZOOL 213 or MICB 380 One of the following: ZOOL 411—Cell Biology ZOOL 422—Vertebrate Physiology ZOOL 430—Vertebrate Embryology ZOOL 495—Mammalian Histology MICB 360—Medical Virology MICB 440—Pathogenic Microbiology MICB 450—Immunology	19–20
D. Mathematics MATH 220, 221 or MATH 140, 141	6–8
E. Physics 121, 122, or 141, 142	8
F. Additional upper-level courses from any one of the following combinations: 1. Zoology—seven hours on the 300–400 level, including one laboratory course 2. Microbiology—seven hours on the 300–400 level, including one laboratory course 3. CHEM 321—Quantitative Analysis, plus any three-credit course at the 300–400 level in the physical or biological sciences which is approved by the Pre-medical Advisor 4. BCHM 461, 462, 463, and 464 5. Nine hours on the 300–400 level in any one department of the Division of Arts and Humanities or the Division of Behavioral and Social Sciences.	7–10
G. Electives as needed to total at least 90 credits	0–4
Total	90–92

Incoming freshmen interested in this three-year program are strongly urged to consult the Pre-medical Advisor before registration for the first semester at College Park.

Students accepted in the combined arts-medicine program may receive the B.S. degree (arts-medicine) after satisfactory completion of the first year at The University of Maryland Medical School upon recommendation by the Dean of the School of Medicine and approval by the College Park Campus, the degree to be awarded in August following the first year of medical school. The courses of the first year of medical school constitute the major, the College Park courses listed above constitute the supporting area.

Participation in the three-year program in no way guarantees admission to The University of Maryland School of Medicine. Three-year students compete with the four-year students for admission.

Pre-Nursing

Advisor: Stewart

College Park students may prepare themselves not only for entrance into The University of Maryland nursing program but also for entrance into nursing programs at other colleges and universities. To do this efficiently, students should obtain program information when first entering college so that requirements can be taken in normal sequence. Information for The University of Maryland School of Nursing is available at the Health Professions Advising Office, Room 3103, Turner Laboratory. Bulletins from other colleges may be available at the same location, or they may be obtained individually.

The School of Nursing, located in Baltimore (UMAB), offers a four-year program leading to the Bachelor of Science degree in Nursing. The first two

years of preprofessional courses may be taken at any University of Maryland campus except UMAB, or any other accredited college or university, while the final two years of upper division work are offered only at the School of Nursing.

In addition to the aforementioned generic program, an "R.N. program" is offered registered nurses who desire to earn a B.S.N. After completing preprofessional coursework, the R.N. will advance to senior status by validating, by the use of advanced placement examinations, previously acquired nursing knowledge. The senior year is designed to provide the student with an understanding of a conceptual framework which can be used in organizing nursing knowledge, implementing professional nursing care and evaluating the care given.

Application and Admission. *High school students* who wish to enroll in the pre-nursing curriculum at College Park must meet admission requirements of that campus. High school students should enroll in a college preparatory curriculum including biology, chemistry and 3 units of college preparatory mathematics.

Pre-nursing students should begin the application process for professional school in the fall of the sophomore year. UMAB applications and instructions are available in the Health Professions Advising Office. Applications for other programs must be obtained individually from the respective colleges.

Enrollment as a pre-nursing student at any campus does not guarantee admission to the nursing program at UMAB or UMBC or to any other nursing program.

The following courses are required for admission to The University of Maryland School of Nursing. Course requirements for other nursing programs can be found in the respective college catalogs.

	Semester Credit Hours
Chemistry 103, 104	4, 4
English 101, 278C	3, 3
Zoology 101	4
MATH 110 or higher	3
Humanities (literature, history, philosophy, math, fine arts, language, speech)*	9
Psychology 100	3
Sociology 100 or 105	3
EDHD 320	3
Other social sciences (sociology, psychology, anthropology, government & politics, economics, geography)	3
Zoology 201, 202	4, 4
Microbiology 200	4
Nutrition 200	3
Elective	2–3
	59–60

* Courses must include at least one course which is not mathematics or English.

Further Information. At College Park contact the Nursing Advisor, Room 3103, Turner Laboratory, College Park, MD 20742. Telephone (301) 454–2540. In Baltimore contact the Director for Admissions, The University of Maryland, School of Nursing, 655 W. Lombard Street, Baltimore, Maryland 21201. Telephone (301) 528–6282.

Pre-Optometry

Advisor: Love

Requirements for admission to schools and colleges of optometry vary somewhat, and the pre-optometry student should consult the catalogs of the optometry schools and colleges for specific admission requirements. A minimum of two years of pre-optometry studies is required for admission to all accredited schools, and about half of the schools require a minimum of three years. At present, more than two-thirds of successful applicants hold a bachelor's or higher degree. Students who contemplate admission to optometry schools may major in any program that the University offers, but would be well-advised to write to the optometry schools of their choice for specific course requirements for admission. In general, pre-optometry students should follow a four-year baccalaureate program which includes the following.

	Semester Credit Hours
Zoology and Microbiology	4–12
Inorganic Chemistry	8
Organic Chemistry	4–8
Physics	8
Math through differential calculus	6
English	6
Psychology	3–6
Statistics	3
Social Sciences	6

The State of Maryland participates in interstate contracts with five schools and colleges of optometry, located in Alabama, Illinois, Pennsylvania, Tennessee and Texas. The contracts insure available places in entering classes and provide for partial tuition remission for qualified applicants who are residents of Maryland.

For additional information on pre-optometry studies, contact the Pre-optometry Advisor, Room 3103, Turner Laboratory, The University of Maryland, College Park, MD 20742. Telephone (301) 454–2540.

Pre-Osteopathic Medicine

Advisor: Love

The preprofessional requirements for osteopathic medical school are essentially identical to those for allopathic medical school, and the student is referred to the pre-medicine discussion above.

The State of Maryland participates in an interstate contract with the West Virginia School of Osteopathic Medicine. This contract will insure available places in entering classes, and will provide for partial tuition remission, for qualified applicants who are residents of Maryland.

For additional information on pre-osteopathy studies, contact the Pre-osteopathy Advisor, Room 3103, Turner Laboratory, The University of Maryland, College Park, MD 20742. Telephone (301) 454–2540.

Pre-Pharmacy

Advisor: Stewart

College Park students may prepare themselves not only for entrance into the UMAB School of Pharmacy but also for entrance into pharmacy programs at other colleges and universities. To do this efficiently, students should obtain program information when first entering college so that requirements can be taken in normal sequence. Information for The University of Maryland School of Pharmacy is available at the Health Professions Advising Office, Room 3103, Turner Laboratory. Bulletins from other colleges may be available at the same location, or they may be obtained individually.

The School of Pharmacy, which is located in Baltimore (UMAB), offers both a five-year program leading to a Bachelor of Science in Pharmacy and a six-year program leading to a Doctor of Pharmacy degree. Both programs are the same until the fifth year, when some students are accepted into the Doctor of Pharmacy program. The first two years, consisting of preprofessional studies, may be completed at any University of Maryland campus except UMAB or at another accredited institution. The final three or four years of upper division work must be completed in the School of Pharmacy at Baltimore.

The purposes of the School of Pharmacy are to train students for the efficient, ethical practice of all branches of pharmacy; to instruct students in general scientific and cultural subjects so they can read critically, express themselves clearly and think logically as members of a profession and citizens of a democracy; and to guide students into productive scholarship and research for the increase of knowledge and techniques in the healing arts of pharmacy.

Application and Admission. Applicants for pre-pharmacy at College Park must meet all admission requirements of that campus. High school students are encouraged to enroll in a college preparatory curriculum emphasizing biology, chemistry and college preparatory mathematics.

Pre-pharmacy students should begin the application process for professional school in fall of the sophomore year. UMAB applications and instructions are available in the Health Professions Advising Office. Applications for other programs must be obtained individually from the respective colleges.

Enrollment as a pre-pharmacy student at any campus does not guarantee admission to the School of Pharmacy on the Baltimore City Campus (UMAB) or to any other school of pharmacy.

The following courses are required for admission to the UMAB School of Pharmacy. Course requirements for other pharmacy programs can be found in the respective college catalogs.

First Year	*Semester Credit Hours*
CHEM 103, 113—General Chemistry I, II	4, 4
CHEM 233, 243—Organic Chemistry I, II	4, 4
MATH 115, 220—Pre-calculus, Calculus	3, 3
ZOOL 101—General Zoology	4
PHYS 121, 122—Fundamentals of Physics I, II	4, 4
ENGL 101—Introduction to Writing	3
Other English	3
Humanities (English, Journalism, Fine Arts, Classics, Modern Language, Philosophy or Speech)	6
Social science (Anthropology, Economics, Geography, History, Government and Politics, Psychology or Sociology)	6
Additional humanities or social science	6
Electives	2–3
	60–61

Further Information. At College Park contact the Pharmacy Advisor, The University of Maryland, Room 3103, Turner Laboratory, College Park, MD 20742. Telephone (301) 454–2540. In Baltimore, contact Admissions Committee Chairman, The University of Maryland School of Pharmacy, 20 North Pine Street, Baltimore, Maryland 21202. Telephone (301) 528–7650.

Pre-Physical Therapy

Advisor: Stewart

College Park students may prepare themselves not only for entrance into University of Maryland physical therapy programs but also for entrance into physical therapy programs at other colleges and universities To do this efficiently, students should obtain program information when first entering college so that requirements can be taken in normal sequence Information for The University of Maryland programs is available at the Health Professions Advising Office, Room 3103, Turner Laboratory Bulletins from other colleges may be seen at the same location, or they may be obtained individually

The University of Maryland offers two B S programs in physical therapy One is given by the Department of Physical Therapy at the Baltimore City Campus (UMAB) and the other is given at the Eastern Shore Campus (UMES), in Princess Anne.

For either of these programs, the first two years, consisting of preprofessional studies, may be completed on any University of Maryland campus (except UMAB) or any regionally accredited university or college It should be noted that the junior year course sequence for the UMAB program begins in summer while the junior year course sequence for the UMES program begins in the fall

The American Physical Therapy Association has resolved that after 1990 all entry-level physical therapy degrees must be post-baccalaureate. Therefore, it can be expected that there will be changes in both of The University of Maryland programs in the next few years. Prospective students would be well advised to keep informed on this situation.

The professional services of the physical therapist are offered to people who are disabled by illness or accident or were born with a handicap Clinical practitioners are responsible for the evaluation of each patient's ability, disability and potential for recovery The most common areas of disorder include neuromuscular, musculoskeletal, sensory motor, and related cardio-vascular and respiratory functions.

On the basis of test findings a treatment program is planned and implemented within the referral of the licensed physician or dentist with whom the contact is maintained regarding patient care and progress Treatment techniques include the therapeutic use of heat, cold, water, electricity light, ultra-sound, massage exercise and functional training Instruction is given to the patient, the family and others who might help during the treatment and convalescent period

Most physical therapists are employed in hospital clinics, rehabilitation centers, private practice, schools for handicapped children and nursing homes.

Application and Admission. Applicants for the pre-physical therapy program at College Park must meet all admission requirements for that campus High school students should pursue a college preparatory program Subjects specifically recommended are biology, chemistry, physics and three units of college preparatory mathematics.

Pre-physical therapy students should begin the application process for professional school in fall of the sophomore year UMAB or UMES applications and instructions are available in the Health Professions Advising Office Applications for other programs must be obtained individually from the respective colleges.

Enrollment as a pre-physical therapy student at any campus does not guarantee admission to the physical therapy programs at either UMAB or UMES or to any other physical therapy programs.

The following courses are required for admission to the UMAB and UMES Physical Therapy Programs Course requirements for other programs can be found in the respective college catalogs.

	Semester Credit Hours	
	UMAB	*UMES*
CHEM 103, 104*	8	8
PHYS 121, 122	8	8
ZOOL 101	4	4
ZOOL 201, 202		8
ZOOL 201, 202 or 290	4	
MATH 110, 111 or MATH 115, 220	6	3
Statistics	3	3
Social Science (Afro-American studies, anthropology, economics, government and politics, urban studies, sociology, geography, women's studies	3	
PSYC 100	3	3
Psychology (developmental, abnormal, educational, or personality study recommended)	3	3
ENGL 101	3	3
ENGL 240, 278C		6
SPCH 107 or 100	3	3
Arts and humanities (history [not for UMES] literature, foreign language, philosophy or fine arts)	6	6
Health education		2–3
Physical education		2
Electives**	6	1–2
Total	60	64

* CHEM 113 may be substituted for CHEM 104

** For the UMAB program no more than two credits of non-theory or skills may be used Review of introductory courses may not be used if below the required level in biology, chemistry, physics, math or English.

Further Information. At College Park contact the Physical Therapy Advisor, Room 3103, Turner Laboratory, College Park, MD 20742 Telephone (301) 454–2540 AT UMES, contact Dr Raymond Blakely Room 2225, Somerset Hall, UMES, Princess Anne, MD 21853 Telephone (301) 651–2200, extension 527 In Baltimore contact the Department of Physical Therapy, 32 S Greene Street, Baltimore, MD 21201 Telephone (301) 528–7720.

Pre-Podiatric Medicine

The preprofessional requirements for podiatric medical school are essentially identical to those for allopathic medical school, and the student is referred to the pre-medicine discussion above

For additional information on pre-podiatry studies, contact the Pre-podiatry Advisor The University of Maryland, Room 3103, Turner Laboratory, College Park, MD 20742. Telephone (301) 454–2540.

Pre-Veterinary Medicine

The pre-veterinary medicine program is based upon the requirements established by the colleges of veterinary medicine where students who are residents of Maryland may be offered admission. Four such institutions currently offer admission to Maryland residents

The Virginia-Maryland Regional College of Veterinary Medicine will accept up to 30 Maryland residents per year *Minimum* semester credit requirements for admission are biology 8, organic chemistry 8, physics 8, math 6 (3 calculus recommended), English 6, humanities/social science 6 The Graduate Record Examination, Aptitude and Advanced Biology Sections are also required

The Ohio State University, College of Veterinary Medicine will accept up to six Maryland residents per year *Minimum* semester credit requirements for admission are biology 8, chemistry 16, biochemistry 3, genetics 3, microbiology 3, calculus 3, physics 8, humanities and social studies 14, English composition 3, electives (science) 7 The Veterinary Aptitude Test or the GRE is required

The University of Pennsylvania School of Veterinary Medicine and The New York State College of Veterinary Medicine at Cornell University will together admit a maximum of nine Maryland residents per year Admission requirements are to be obtained directly from the University of Pennsylvania and Cornell University

The Colleges of Veterinary Medicine have the final and exclusive authority on all matters related to admission

The above indicated course requirements represent the minimum Students are urged to select additional agricultural and life science courses and to excel academically in order to be competitive applicants Potential veterinary medicine applicants should gain experience with practicing veterinarians and also in animal related areas (farm, animal shelter, zoo, laboratory animal facility etc)

No specific major is required for favorable consideration by a veterinary school admissions committee

It is not possible for colleges of veterinary medicine to admit all eligible applicants Therefore, preprofessional students are urged to consider alternative objectives in a program leading to the B S degree

While no specific major is required for consideration by a veterinary school, many students will select a major in animal sciences within the College of Agriculture Others may choose a degree in general biological science or in one of the related departmental majors such as zoology, microbiology, chemistry, biochemistry, etc

For additional information, please contact Associate Dean, Maryland Campus VMRCVM The University of Maryland, 1316 Animal Science Annex, College Park, MD 20742 Telephone (301) 454–4268

4 University Studies Program

The General Education Requirement for Undergraduates

Dean for Undergraduate Studies: Shoenberg

The University Studies Program is the general education requirement at The University of Maryland College Park. This program must be completed by all students beginning baccalaureate study after May, 1980. The requirements of the University Studies Program represent a third of the total academic work required for graduation and are designed to be spread throughout the student's four years of baccalaureate study. It is the purpose of the Program that students be prepared to become productive, aware and sensitive members of society, capable not only of understanding their world and the many kinds of people in it, but also of taking responsibility for their own decisions and their own lives.

The program has three major parts: Fundamental Studies, Distributive Studies and Advanced Studies. These areas of study will provide students with the intellectual skills and conceptual background basic to an understanding of any subject matter and to an awareness of general modes of understanding the world.

The Fundamental Studies section of the program is intended to establish the student's ability to participate in the discourse of the University through demonstrated mastery of written English and mathematics. These requirements are to be completed early in the student's program in order to serve as a foundation for subsequent work.

The Distributive Studies requirements are intended, through study in particular disciplines, to acquaint students with the different ways of analyzing and talking about the world that characterize each discipline. Students must select two courses from each of four broad categories: culture and history; natural sciences and mathematics; literature and the arts; and social and behavioral sciences.

In the Advanced Studies, students select courses which show how the different intellectual approaches observed in the Distributive Studies courses compare to each other or may be used in complementary ways to analyze and solve problems. Thus, courses in Advanced Studies require students to exercise critical thinking skills in the analysis of complex problems. To meet the Advanced Studies requirements, students must choose one course from the Development of Knowledge series and one course from the Analysis of Human Problems series.

Requirements in the Distributive Studies and the Advanced Studies are to be met by choosing courses from the list of courses approved for the University Studies Program. The outline of the program and the list of approved courses are given below.

Outline of the Program

These requirements are effective for students beginning baccalaureate study in May, 1980 or thereafter.

A course taken to satisfy divisional, college, major, and/or supporting area requirements may also be used to satisfy University Studies Program requirements if it appears on the list of approved courses for this program.

Courses chosen to meet Distributive Studies requirements and Advanced Studies requirements may be taken on a Pass-Fail basis. Since certain USP courses are also used to satisfy divisional, college, major, and/or supporting area requirements which may *not* be taken Pass-Fail, students are urged to see an advisor before selecting this grading option. Courses used to satisfy USP Fundamental Studies requirements may *not* be taken using the Pass-Fail grading option.

I. Fundamental Studies–9 credits. (Except for ENGL 391 or 393, the Fundamental Studies requirement must be attempted by the time the student has completed 30 credit hours and passed successfully by the time the student has completed 60 credit hours.)
  A. English Composition–6 credits
    1. ENGL 101–3 credits
      a. Students with TSWE (SAT verbal subtest) below 330, take ENGL 101A.
      b. Students with SAT verbal 600 or above are exempt.
      c. Students with AP score of 4 or 5, or an AP of 3 plus SAT verbal of 600 or above, are exempt.
      d. ENGL 101X—3 credits. Students for whom English is a second language must register for ENGL 101X instead of ENGL 101. To register for ENGL 101X, a student must present one of the following: (1) a score of 550 on the TOEFL, or (2) a score of 220 on the Comprehensive English Language Test (CELT) administered at the College Park Campus by the Maryland English Institute, or (3) successful completion of the Institute's semi-intensive course in English. Based on scores from either the TOEFL or CELT a student might be required to complete a program of English language instruction for non-native speakers through the Maryland English Institute *before* being allowed to register for ENGL 101X.
    2. ENGL 391 (Junior Level Expository Writing) or 393 (Technical Writing)–3 credits
      a. Must be taken *after* student has completed 56 credit hours (i.e., has reached junior standing).
      b. Students with SAT verbal 700 or above, or A in ENGL 101, or AP of 4 or 5 are exempt.
  B. Mathematics–3 credits. MATH 110 (or the modular equivalent MATH 102–3–4) or MATH 115.
    1. Students with the following minimum examination scores or higher are exempt:
      a. SAT: 600.
      b. College Board Achievement Tests in Mathematics, Level I or II: 600.
      c. Advanced Placement Examinations, Calculus AB or BC: 3.
      d. Any CLEP *Subject* Examination in Mathematics: 60.
    2. Successful completion of any of the following entry courses of a higher level than MATH 110: MATH 111, 140, 141, 150, 151, 220, 221, 240, 241, 246, 250, 251, STAT 100, 250.

II. Distributive Studies–minimum 24 credits.
Courses to meet these requirements must be chosen from a list approved by the University Studies Committee. (See the *Schedule of Classes* for this list.)
  A. Culture and History (minimum: 6 credits, 2 courses).
  B. Natural Sciences and Mathematics (minimum: 6 credits, 2 courses). One course must be a laboratory science.
  C. Literature and the Arts (minimum: 6 credits, 2 courses). Courses must be taken in two different departments.
  D. Social and Behavioral Sciences (minimum: 6 credits, 2 courses).

III. Advanced Studies–6 credits. This requirement may be fulfilled only *after* student has completed 56 credit hours.
It is intended that, in fulfilling this requirement, students choose courses that offer a contrast to the major rather than supplementing it. Courses to fulfill these requirements must be from two *different* units outside the department of the student's major.

Courses to meet these requirements must be chosen from a list designated by the University Studies Committee as suitable for satisfying each of the requirements. (See the *Schedule of Classes* for this list.)
  A. The Development of Knowledge (3 credits, 1 course). Courses which focus on the creation, discovery, exploration, testing and evaluation of knowledge in one or more disciplines.
  B. The Analysis of Human Problems (3 credits, 1 course). Courses which focus on the application of knowledge from one or more disciplines to the study of important human problems.

Special Note for International Students

Special requirements in English for international students are discussed above.

Approved Courses

Listed below are the courses approved by the University Studies Program Committee as of January, 1985. Students must choose courses from this list in order to meet the requirements of the Program.

Distributive Studies (A) Culture and History
AASP 100—Introduction to Afro-American Studies
AASP 200—African Civilizations
AASP 202—Black Culture in the United States
AMST 201—Introduction to American Studies I
AMST 205—Material Aspects of American Life
AMST 207—Contemporary American Cultures
ANTH 298A—Chesapeake: An Archaeology of Maryland

ANTH 298B—The First Americans
CHIN 101—Elementary Chinese I
CHIN 102—Elementary Spoken Chinese
CHIN 103—Elementary Written Chinese
CHIN 201—Intermediate Spoken Chinese I
CHIN 202—Intermediate Written Chinese II
CHIN 203—Intermediate Spoken Chinese II
CHIN 204—Intermediate Written Chinese II
CLAS 170—Greek and Roman Mythology
EDPA 210—Historical and Philosophical Perspectives on Education
ENGL 260—Introduction to Folklore
FMCD 330—Family Patterns
FREN 101—Elementary French I
FREN 102—Elementary French II
FREN 103—Review of Elementary French
FREN 104—Intermediate French
FREN 121—Accelerated French I
FREN 122—Accelerated French II
FREN 311—French Conversation: Contemporary Issues
FREN 312—French Conversation: Current Cultural Events
FREN 370—Aspects of French Civilization
GEOG 150—World Cities
GEOG 202—The World in Cultural Perspective
GEOG 321—Maryland and Adjacent Areas
GEOG 324—Europe—Contemporary Landscapes
GEOG 325—The Soviet Union
GEOG 326—Africa
GERM 101—Elementary German I
GERM 102—Elementary German II
GERM 103—Review of Elementary German
GERM 104—Intermediate German
GERM 115—Intermediate German II
GERM 116—Review of Intermediate German
GERM 141—Elementary Yiddish I
GERM 142—Elementary Yiddish II
GERM 144—Intermediate Yiddish I
GERM 145—Intermediate Yiddish II
GERM 280—German-American Cultural Contrast
GERM 281—Women in German Society (in English)
GREK 101—Elementary Greek I
GREK 102—Elementary Greek II
GREK 203—Intermediate Greek
GVPT 240—Political Ideologies
HEBR 111—Elementary Hebrew I
HEBR 112—Elementary Hebrew II
HEBR 211—Intermediate Hebrew I
HEBR 212—Intermediate Hebrew II
HEBR 298A—Special Topics in Jewish Studies. Introduction to Jewish Beliefs and Practices
HEBR 333—Hebrew Civilization
HEBR 334—Hebrew Civilization
HIST 101—Great Ideas, Events and Personalities in History
HIST 115—Modern Business History
HIST 130—The Ancient World
HIST 131—The Medieval World
HIST 132—The Rise of the West 1500–1789
HIST 133—Modern Europe: 1789–Present
HIST 144 & 145—The Humanities I and II
HIST 156—History of the United States to 1865
HIST 200—Introduction to the History of Science
HIST 201—Science and Technology in World History
HIST 234—History of Britain to 1485
HIST 235—History of Britain, 1461–1714
HIST 236—History of Britain, 1688 to Present
HIST 237—Russian Civilization
HIST 250—Latin American History I (to 1810)
HIST 251—Latin American History II (1810 to present)
HIST 280—Islamic Civilization
HIST 282—History of the Jewish People I (to late Middle Ages)
HIST 284—East Asian Civilization I (to 1700)
HIST 285—East Asian Civilization II (since 1700)
HIST 290—African Civilization
HONR 110—Freshman Honors Colloquium. Cultural and Historical
HONR 318—Honors Seminar, Cultural and Historical
ITAL 101—Elementary Italian I
ITAL 102—Elementary Italian II
ITAL 121—Accelerated Italian I
ITAL 122—Accelerated Italian II
ITAL 203—Intermediate Italian
ITAL 204—Review Grammar and Composition
ITAL 211—Intermediate Conversation
ITAL 301—Advanced Conversation and Composition
ITAL 370—Italian Civilization
JAPN 101—Elementary Japanese I
JAPN 102—Elementary Japanese II
JAPN 201—Intermediate Spoken Japanese I
JAPN 202—Intermediate Written Japanese I
JAPN 203—Intermediate Spoken Japanese II
JAPN 204—Intermediate Written Japanese II
JAPN 217—Buddhism and Japanese Literature in Translation
LATN 101—Elementary Latin I
LATN 102—Elementary Latin II
LATN 120—Intensive Latin
LATN 203—Intermediate Latin I
LATN 204—Intermediate Latin II
LATN 220—Intermediate Intensive Latin
PHED 293—History of Sport in America
PHIL 100—Introduction to Philosophy
PHIL 110—Plato's *Republic*
PHIL 250—Philosophy of Science I
PORT 101—Elementary Portuguese I
PORT 102—Elementary Portuguese II
PORT 203—Intermediate Portuguese
SLAV 101—Elementary Russian I
SLAV 102—Elementary Russian II
SLAV 114—Intermediate Russian I
SLAV 115—Intermediate Russian II
SLAV 281—Russian Culture
SPAN 101—Elementary Spanish I
SPAN 102—Elementary Spanish II
SPAN 103—Review of Elementary Spanish
SPAN 203—Intermediate Spanish
SPAN 204—Review of Oral and Written Spanish
SPAN 205—Intermediate Conversation
SPAN 311—Advanced Conversation I
SPAN 312—Advanced Conversation II
TEXT 345—History of Costume I
TEXT 347—History of Costume II
TEXT 363—History of Textiles
THET 310—The American Theatre

Distributive Studies (B) Natural Sciences and Mathematics

Lab Sciences
AGRO 100 & 102—Crops Laboratory and Crop Production
AGRO 302—General Soils
ASTR 100 & 110 or 111—Introduction to Astronomy and Astronomy Laboratory
BIOL 101 and 102—Concepts and Laboratory in Biology
BOTN 100—General Botany for Non-science Students
BOTN 101—General Botany
CHEM 102—Chemistry of Man's Environment
CHEM 103—General Chemistry I
CHEM 104—Fundamentals of Organic and Biochemistry
CHEM 105—Principles of General Chemistry I
CHEM 111—Chemistry in Modern Life
CHEM 113—General Chemistry II
CHEM 115—Principles of General Chemistry II
ENTM 205—Principles of Entomology
GEOG 170 and 171—Maps and Map Use, and Maps and Map Use Laboratory
GEOG 201 & 211—The Geography of Environmental Systems and The Geography of Environmental Systems Laboratory
GEOL 100 & 110—Physical Geology and Physical Geology Laboratory
MICB 100—Basic Microbiology
MICB 200—General Microbiology
PHED 360—Physiology of Exercise
PHYS 106 & 107—Light Perception, Photography and Visual Phenomena and Light Perception, Photography and Visual Phenomena Laboratory
PHYS 114—Energy and the Environment
PHYS 117—Introduction to Physics
PHYS 121—Fundamentals of Physics I
PHYS 122—Fundamentals of Physics II
PHYS 141—Principles of Physics I
PHYS 142—Principles of Physics II
PHYS 191 & 195—Introductory Physics I and Introductory Physics Laboratory I
PHYS 192 & 196—Introductory Physics II and Introductory Physics Laboratory II
PHYS 293 & 295—Introductory Physics Electricity and Magnetism and Intermediate Physics Laboratory
PHYS 294 & 296—Introductory Physics Optics and Modern Physics and Intermediate Physics Laboratory
PHYS 221—General Physics for Science Teachers I
PHYS 222—General Physics for Science Teachers II
PHYS 262—General Physics Heat, Electricity and Magnetism
PHYS 263—General Physics Waves, Relativity and Quantum Physics
ZOOL 101—General Zoology
ZOOL 210—Animal Diversity
ZOOL 212—Ecology, Evolution and Behavior

Non-lab Sciences and Mathematics

AEED 200—Environmental Interpretation
AGRO 105—Soil and the Environment
ANSC 101—Principles of Animal Science
ANTH 101—Introduction to Anthropology
ASTR 100—Introduction to Astronomy
ASTR 181—Introductory Astronomy and Astrophysics I
ASTR 182—Introductory Astronomy and Astrophysics II
ASTR 350—Astronomy and Astrophysics
BIOL 101—Organization and Interrelationships in the Biological World
BOTN 200—Humanistic Botany
BOTN 211—Ecology and Mankind
CHEM 107—Chemistry and Man
ENAG 232—Water, A Renewable Resource
ENES 120—Noise Pollution
ENES 121—The Man-Made World
ENTM 100—Insects
GEOG 140—Coastal Environments
GEOG 170—Maps and Map Use
GEOG 201—The Geography of Environmental Systems
GEOL 100—Physical Geology
GEOL 102—Historical Geology
GEOL 120—Environmental Geology
HESP 305—Anatomy and Physiology of the Speech Mechanism
HONR 120—Freshman Honors Colloquium, Natural Sciences and Mathematics
HONR 328—Honors Seminar, Natural Sciences and Mathematics
MATH 105—Mathematical Ideas
MATH 111—Introduction to Math II
MATH 140—Calculus I
MATH 141—Calculus II
MATH 150—Calculus I (Honors)
MATH 151—Calculus II (Honors)
MATH 210—Elements of Mathematics
MATH 211—Elements of Geometry
MATH 220—Elementary Calculus I
MATH 221—Elementary Calculus II
MATH 240—Introduction to Linear Algebra
MATH 241—Calculus III
MATH 246—Differential Equations for Scientists and Engineers
MATH 250—Calculus III (Honors)
MATH 251—Calculus IV (Honors)
METO 100—Weather and Life
MICB 322—Microbiology and the Public
NUTR 100—Elements of Nutrition
PHYS 101—Contemporary Physics
PHYS 102—Physics of Music
PHYS 106—Light, Perception, Photography and Visual Phenomena
PHYS 111—Physics in the Modern World I
PHYS 112—Physics in the Modern World II
PHYS 161—General Physics: Mechanics and Particle Dynamics
PSYC 206—Developmental Biopsychology
PSYC 301—Biological Basis of Behavior
SOCY 201—Introductory Statistics for Sociology
STAT 100—Elementary Statistics and Probability
STAT 250—Introduction to Statistical Models
ZOOL 181—Life in the Oceans

Distributive Studies (C) Literature and the Arts

Note: Courses must be taken in different departments.

APDS 104—Survey of Design History
ARCH 170—An Introduction to the Built Environment
ARCH 222—History of Western Architecture
ARTH 100—Introduction to Art
ARTH 260—History of Art I
ARTH 261—History of Art II
ARTH 262—Arts of Asia
ARTH 284—Introduction to African Art
CHIN 313—Chinese Poetry and Prose in Translation
CHIN 314—Chinese Fiction and Drama in Translation
CHIN 315—Modern Chinese Literature in Translation
CHIN 441—Traditional Chinese Fiction
CHIN 442—Modern Chinese Fiction
CLAS 370—Greek Literature in Translation
CLAS 371—Latin Literature in Translation
DANC 200—Introduction to Dance
ENGL 201—World Literature: Homer to the Renaissance
ENGL 202—World Literature: The Renaissance to the Present
ENGL 205—Introduction to Shakespeare
ENGL 211—English Literature from Beginnings to 1800
ENGL 212—English Literature from 1800 to the Present
ENGL 221—American Literature: The Beginning to 1865
ENGL 222—American Literature: 1865 to the Present
ENGL 234—Introduction to Afro-American Literature
ENGL 241—Introduction to the Novel
ENGL 242—Readings in Biography
ENGL 243—Introduction to Poetry and Poetics
ENGL 244—Introduction to Dramatic Literature
ENGL 245—Introduction to Film as Literature
ENGL 246—The Short Story
ENGL 247—Literature of Fantasy
ENGL 250—Women in Literature
ENGL 271—Honors World Literature: Homer to the Renaissance
ENGL 272—Honors World Literature: Renaissance to the 20th Century
ENGL 301—Critical Methods in the Study of Literature
ENGL 302—English Medieval Literature in Translation
ENGL 304—Major Works of Shakespeare
ENGL 305—Shakespeare and His Contemporaries: An Introduction
ENGL 310—Medieval and Renaissance British Literature
ENGL 311—Baroque and Augustan British Literature
ENGL 312—Romantic to Modern British Literature
ENGL 313—American Literature
ENGL 345—Twentieth Century Poetry of Britain and America
FREN 250—Readings in French Literature
FREN 340—Modern French Literature in Translation
FREN 350—Advanced Readings in French
FREN 351—French Literature from the Revolution to the Present
FREN 352—French Literature from the Middle Ages to the Revolution
GERM 220—Introduction to German Literature
GERM 285—German Film and Literature
GREK 204—Intermediate Greek (Homer)
HEBR 223—The Hebrew Bible: Narrative
HEBR 224—The Hebrew Bible: Poetry and Rhetoric
HEBR 231—Introduction to Jewish Literature in Translation
HONR 130—Freshman Honors Colloquium: Literature and the Arts
HONR 338—Honors Seminar: Literature and the Arts
HORT 160—Introduction to the Art of Landscaping
ITAL 251—Introduction to Italian Literature
ITAL 351—Italian Literature from Dante to the Renaissance
ITAL 352—Italian Literature from the Renaissance to the Present
ITAL 376—The Italian Opera Libretto
MUSC 130—Survey of Music Literature
MUSC 140—Music Fundamentals I
MUSC 141—Music Fundamentals II
MUSC 215—The Art of the Performer
RTVF 314—Introduction to the Film
SPAN 221—Readings in Spanish
SPAN 321—Survey of Spanish Literature I
SPAN 322—Survey of Spanish Literature II
SPAN 323—Survey of Spanish American Literature I
SPAN 324—Survey of Spanish American Literature II
THET 110—Introduction to the Theatre
WMST 250—Women, Art and Culture

Distributive Studies (D) Social and Behavioral Studies

AMST 203—Popular Culture in America
ANTH 102—Introduction to Anthropology
ANTH 221—Man and Environment
ANTH 241—Introduction to Archaeology
ANTH 271—Language and Culture
AREC 240—Environmental and Human Ecology
ARSC 310—Management and Leadership I
CJUS 100—Introduction to Criminal Justice
CNEC 100—Introduction to Consumer Economics
CRIM 220—Criminology
ECON 105—Economics of Social Problems
ECON 201—Principles of Economics I
ECON 203—Principles of Economics II
ECON 205—Fundamentals of Economics
ECON 307—Development of Economic Ideas
ECON 310—Evolution of Modern Capitalism in Western Europe and the United States
ECON 311—American Economic Development
EDHD 306—A Study of Human Behavior
EDHD 330—Human Development and Societal Institutions
EDPA 201—Education in Contemporary American Society
ENGL 280—Introduction to Linguistics
ENGL 385—English Semantics
FMCD 201—Concepts in Community Development
FMCD 250—Decision Making in Families and Communities
FOOD 110—Food for People
FOOD 300—Economics of Food Consumption
GEOG 100—Introduction to Geography
GEOG 110—The World Today: A Regional Geography
GEOG 130—Developing Countries
GEOG 203—Economic Geography
GVPT 100—Principles of Government and Politics
GVPT 170—American Government
GVPT 220—Introduction to Political Behavior
GVPT 273—Introduction to Environmental Policy

GVPT 343—Political Themes in Contemporary Literature
GVPT 300—International Political Relations
HESP 120—Introduction to Linguistics
HIST 157—History of the U.S. Since 1865
HLTH 230—Introduction to Health Behavior
HLTH 285—Controlling Stress and Tension
HONR 140—Freshman Honors Colloquium: Social and Behavioral Sciences
HONR 348—Honors Seminar: Social and Behavioral Sciences
JOUR 100—Introduction to Mass Communication
LING 200—Introduction to Linguistics
LING 240—Language and Mind
PHED 287—Sport and American Society
PHED 350—Psychology of Sport
PHED 385—Motor Learning and Skilled Performance
PHIL 140—Contemporary Moral Issues
PHIL 245—Political and Social Philosophy I
PSYC 100—Introduction to Psychology
PSYC 221—Social Psychology
PSYC 310—Perception
PSYC 331—Introduction to Abnormal Psychology
PSYC 335—Personality and Adjustment
PSYC 355—Child Psychology
RECR 130—History and Introduction to Recreation
RTVF 124—Mass Communication in 20th Century Society
SOCY 100—Introduction to Sociology
SOCY 105—Introduction to Contemporary Social Problems
SOCY 230—Sociological Social Psychology
SOCY 300—American Society
SOCY 327—Introduction to the Study of Deviance
SOCY 331—Work, Bureaucracy and Industry
SOCY 341—Inequality in American Society
SOCY 498K—Sociology of Knowledge
SPCH 350—Foundation of Communication Theory
URBS 100—Introduction to Interdisciplinary Urban Studies
URBS 210—Behavioral and Social Dimensions of the Urban Community
URBS 220—Environmental and Technological Dimensions of the Urban Community
URBS 320—The City and the Developing National Culture of the United States
WMST 200—Introduction to Women's Studies

Advanced Studies (A) Development of Knowledge

AMST 418E—Cultural Themes in America: the American Image of Africa
AMST 418K—Cultural Themes in America: Race in America: Theory and Policy
AMST 428A—American Cultural Eras: Social Dramas in American Cultural History
AMST 429B—Perspectives on Popular Culture: Science Fiction in American Culture
AMST 432—Literature and American Society
ANTH 371—Introduction to Linguistics
ANTH 389C—Culture and Personality
ANTH 401—Cultural Anthropology: Principles and Processes
ANTH 451—Archaeology of the New World
ARHU 309—Forms and Forces of Human Experience: An Interdisciplinary Exploration
ASTR 300—Stars and Stellar Systems
ASTR 330—Solar System Astronomy
ASTR 340—Galaxies and the Universe
ASTR 380—Life in the Universe
BCHM 361—Origins of Biochemistry
CJUS 330—Contemporary Legal Policy Issues
CLAS 309B—Women in Ancient Greece and Rome
CLAS 320—Women in Classical Antiquity
CLAS 374—Greek Tragedy in Translation
CLAS 470—Advanced Mythology
ECON 402—Business Cycles
EDCI 488N—Learning Styles and Learning Environments
EDMS 451—Introduction to Educational Statistics
(Students who have credit for PSYC 200, ECON 421, BMGT 230/231, GVPT 422, GEOG 305 OR SOCY 201 cannot receive credit for EDMS 451. Students who wish to use EDMS 451 in lieu of one of the above to satisfy departmental requirements must receive approval from their departmental academic advisor.)
ENGL 379A—Special Topics in Literature: Studies in Mythmaking
ENGL 379E—Special Topics in Literature: Film Analysis—The Rhetoric of Fictional Worlds
ENGL 379I—Special Topics in Literature: Science and Literature
ENGL 379J—Special Topics in Literature: Interpreting the Bible
ENGL 379K—Special Topics in Literature: Private Lives
ENGL 379V—Special Topics in Literature: Modern Poetry and the Visual Arts
ENGL 385—English Semantics
ENGL 389A—Language of Advertising
ENGL 412—Literature of the 17th Century, 1600–1660.
ENGL 420—Literature of the Romantic Period
ENGL 453—Literary Criticism
ENGL 489A—Special Topics in English Language: The Language of Advertising
GEOG 370—Principles of Cartography
GEOL 301—Development of Knowledge
GERM 348—Yiddish Culture
GERM 349A—Yiddish Literature in Translation: The Holocaust in Film and Literature
GERM 479B—Language and Science
GNED 301—The Arts and the Sciences
GVPT 442—History of Political Theory—Modern and Recent
GVPT 443—Contemporary Political Theory
HEBR 498R—Reconstructing Ancient Civilizations: the Case of Mesopotamia
HIST 311—Approaches to the Past
HIST 402—The Development of Modern Physical Science: From Newton to Einstein
HIST 412—Readings in Psycho-History
HLTH 498T—Ways of Knowing about Human Stress and Tension
HONR 368—Honors Seminar: Development of Knowledge
HSAD 451—Gaming Simulation in Design I
LING 440—Grammars and Cognition
MATH 310—Introduction to Analysis
MATH 406—Introduction to Number Theory
MATH 430—Euclidean and Non-Euclidean Geometries
MUSC 340—Survey of Music Literature
MUSC 448E—Music and Science
NUTR 335—History of Nutrition
PHIL 308A—Philosophy of Literature and Film
PHIL 308D—Philosophy of History
PHIL 308X—Discovery and Analogy in Science
PHIL 310—Ancient Philosophy
PHIL 328A—Marxist Philosophy
PHIL 331—Philosophy of Art
PHIL 332—Philosophy of Beauty
PHIL 334—Philosophy of Music
PHIL 408—Topics in Contemporary Philosophy
PHIL 408A—The Nature of Scientific Understanding
PHIL 408C—Contemporary French and German Philosophy (cross-listed with FREN 479B)
PHIL 408E—Aesthetic Theory and Philosophy of Criticism
PHIL 428A—Origins of the Modern Scientific World-View
PHIL 447—Philosophy of Law
PHIL 450—Scientific Thought I
PHIL 451—Scientific Thought II
PHIL 452—Philosophy of Physics
PHIL 453—Philosophy of Science II
PHIL 454—Philosophy of Economics
PHIL 455—Philosophy of the Social Sciences
PHIL 456—Philosophy of Biology
PHIL 457—Philosophy of History
PHIL 458—Topics in the Philosophy of Science
PHIL 458A—Philosophy of Agricultural Science
PHIL 458E—Historical and Conceptual Foundations of Mathematics
PHIL 458X—Causation and Causal Thinking
PHYS 420—Principles of Modern Physics
PHYS 421—Introduction to Modern Physics
PHYS 499F—Twentieth Century Physics
SOCY 403—Intermediate Sociological Theory
SPCH 450—Classical Rhetoric
THET 495—History of Theatrical Theory and Criticism
WMST 400—Theories of Feminism
ZOOL 301—Biological Issues and Scientific Evidence

Advanced Studies (B) Analysis of Human Problems

AEED 323—Developing Youth Programs
AGRO 303—International Crop Production
AMST 418B—Culture and Mental Disorders
AMST 418C—Cultural Themes in America: The American Environment: Conservation and Ecology
AMST 418D—Cultural Themes in America: Growing Up American
AMST 428B—American Cultural Eras: American Film Culture in the 1960s
ANTH 389B—Medical Anthropology
AREC 365—World Hunger: Population, Food Supplies and Public Policy
CHEM 374—Technology: Energy and Risk
CLAS 370—Greek Literature in Translation
CNEC 310—Consumer Economics and Public Policy
CNEC 410—Consumer Finance
CNEC 431—The Consumer and the Law
CNEC 435—Economics of Consumption
CNEC 437—Consumer Behavior
DHCR 400—The Future of the Human Community
ECON 415—Introduction to Economic Development of Undeveloped Areas
ECON 451—Public Choice and Public Policy
ECON 490—Survey of Urban Economic Problems and Policies
EDCI 381—The Parental Role in the Educative Process

EDCP 420—Education and Racism
EDHD 445—Guidance of Young Children
EDIT 476—Application of Technology to Societal Problems
EDIT 488T—Issues Confronting Families Past and Future A Multi-disciplinary Approach
EDPA 488G—Technology Social Change and Education
ENAG 315—Energy—Its Effects on Agriculture and Food
ENGL 379N—Special Topics in Literature Literature of Sentiment and Sentimentality
ENGL 379O—Special Topics in Literature Utopia and Utopian Visions
ENGL 379R—Different Views of the Bay
ENGL 379S—Changing Ideas of the City in Western Literature
ENGL 479C—Selected Topics in English and American Literature After 1800 Ideal and Real Communities in 19th Century American Literature
ENGL 479D—Selected Topics in English and American Literature After 1800 On Argument
ENTM 303—International Pest and Pesticide Problem Analysis and Solution
FMCD 381—Poverty and Affluence
FMCD 487—Legal Aspects of Family Problems
FMCD 497—The Child and the Law
FREN 478B—Themes and Movements of French Literature in Translation: French Women Writers
FREN 478C—I and They The Conflict Between the Individual and Society in French Literature
FREN 479A—The Age of Anxiety (in English)
GEOG 434—Agricultural and Rural Development
GEOG 462—Water Resources and Water Resource Planning
GEOG 463—Geographic Aspects of Pollution
GEOG 464—Energy Resources and Planning
GERM 489J—Honor as a Theme in Western Literature
GERM 489A—Reason and Faith
GVPT 403—Law, Morality and War (cross-listed with PHIL 446)
GVPT 432—Civil Rights and the Constitution
GVPT 441—History of Political Theory Ancient and Medieval
GVPT 457—American Foreign Relations
GVPT 462—Urban Politics
GVPT 471—Women and Politics
GVPT 479C—Problems of American Public Policy
HIST 312—Crisis and Change in the United States
HIST 313—Authority and Freedom. A Problem in Western Civilization
HIST 314—Nationalism and Nation Building in the Middle East
HIST 316—Slavery and Race Relations in Latin America
HIST 317—The Professions and Society
HIST 407—History of Technology
HIST 459—Society in America Historical Topics
HONR 378—Honors Seminar Analysis of Human Problems
ITAL 411—Dante
NUTR 425—International Nutrition
NUTR 498H—Development and Modification of Food Habits
PERH 490—Theories of Children's Love and Peace Behaviors
PHIL 308B—Philosophy of Life
PHIL 308C—Law Morality and War (cross-listed with GVPT 403)
PHIL 308F—Philosophical Aspects of Feminism
PHIL 340—Making Decisions
PHIL 342—Moral Problems in Medicine
PHIL 408L—Racial and Sexual Discrimination
PHIL 446—Law, Morality and War (cross-listed with GVPT 403)
PHIL 498A—Analysis and Design of Legal and Moral Institutions
PHYS 318—Topics in Contemporary Physics the Risks of Nuclear Power
SOCY 305—Scarcity and Modern Society
SOCY 325—Sex Roles
SOCY 333—Technology and Society
SOCY 427—Deviant Behavior
SOCY 431—Formal and Complex Organizations
SOCY 441—Social Stratification
SOCY 460—Sociology of Work
SOCY 464—Military Sociology
SOCY 498A—Medical Sociology
SOCY 498N—Sociology of Nuclear War
SOCY 498R—Work, Family, Community and Friendship Issues in Social Identity and Well Being
SPCH 425—Communication and Sex Roles
ZOOL 346—Human Genetics and Society
ZOOL 381—Natural History of the Chesapeake Bay. Past, Present and Future

Note: This list includes all courses approved by the University Studies Program Committee as suitable for satisfying requirements of the program. Since all courses approved are not offered every semester, students should consult the *Schedule of Classes* each semester for the most current list.

5 Course Offerings

Course Numbering System

NUMBER ELIGIBILITY

000–099 Non-credit course
100–199 Primarily freshman course
200–299 Primarily sophomore course
300–399 Junior, senior course not acceptable for credit toward graduate degrees.
385–387 Campus-wide internship courses; refer to information describing the Office of Experiential Learning in Part 1
400–499 Junior, senior course acceptable for credit towards some graduate degrees.
500–599 Professional School course (Dentistry, Architecture, Law, Medicine) or postbaccalaureate course.
600–899 Course restricted to graduate students.
799 Masters Thesis credit
899 Doctoral Dissertation credit.

Courses with last digit of 8 or 9 can be repeated for additional credit.

AASP — Afro-American Studies

AASP 100 Introduction to Afro-American Studies (3) A survey of significant aspects of black life and thought which are reflected in black literature, music and art. This interdisciplinary course examines the African cultural and historical backgrounds and traces the development of black culture in Africa, the United States and the Caribbean from the fifteenth century to contemporary times. Emphasis is placed upon the social, political and economic changes in black life that have influenced the ideas of black artists and spokesmen.

AASP 200 African Civilization (3) A survey of African civilizations from 4500 B.C. to present. Analysis of traditional social systems. Discussion of the impact of European colonization on these civilizations. Analysis of the influence of traditional African social systems on modern African institutions as well as discussion of contemporary processes of Africanization.

AASP 202 Black Culture in the United States (3) The course examines important aspects of American Negro life and thought which are reflected in Afro-American literature, drama, music and art. Beginning with the cultural heritage of slavery, the course surveys the changing modes of black creative expression from the nineteenth-century to the present.

AASP 298 Special Topics in Afro-American Studies (3) An introductory multi-disciplinary and inter-disciplinary educational experience to explore issues relevant to black life, cultural experiences, and political, economic and artistic development. May be repeated to a maximum of six credits if subject matter is different.

AASP 300 The Black Community and Public Policy (3) A study of the role and impact of the black community in public policy formulation, scope and methods in public policy focusing on specific problems in the black community, analysis and review of relationships between the policy makers and the community. With permission of the program, students may elect to devote time to specific community projects as part of the requirements of the course. The student will not serve in an agency in which he is already employed.

AASP 311 The African Slave Trade (3) The relationship of the slave trade of Africans to the development of British capitalism and its industrial revolution and to the economic and social development of the Americas.

AASP 312 Social and Cultural Effects of Colonization and Racism (3) A comparative approach to the study of the social and cultural effects of colonization and racism on black people in Africa, Latin America and in the United States—community and family life, religion, economic institutions, education and artistic expression.

AASP 397 Senior Reading and Research Seminar in Afro-American Studies (3) An interdisciplinary reading and research senior seminar for majors in Afro-American studies or majors in other departments or programs who have completed at least eighteen hours of Afro-American studies courses. Emphasis on research and writing methods in Afro-American studies. A senior thesis will be completed during the course.

AASP 400 Directed Readings in Afro-American Studies (3) The readings will be directed by the Director of Afro-American Studies. Topics to be covered, the topics will be chosen by the director to meet the needs and interests of individual students.

AASP 401 Seminar in Afro-American Studies (3) The theory and concepts of the social and behavioral sciences as they relate to Afro-American studies. Required for the certificate in Afro-American studies. Prerequisites: at least 15 hours of Afro-American studies or related courses or permission of the director.

AASP 403 The Development of a Black Aesthetic (3) An analysis of selected areas of black creative expression in the arts for the purpose of understanding the informing principles of style, techniques, and cultural expression which make up a black aesthetic. Prerequisite: completion of ENGL 443 or AASP 302 or consent of instructor.

AASP 410 Contemporary African Ideologies (3) Analysis of contemporary African ideologies. Emphasis on philosophies of Nyerere, Nkrumah, Senghor, Sekou Toure, Kaunda, Cabral, et al. Discussion of the role of African ideologies on modernization and social change.

AASP 411 Black Resistance Movements (3) A comparative study of the black resistance movements in Africa and America, analysis of their interrelationships as well as their impact on contemporary pan-Africanism.

AASP 428 Special Topics in Black Development (3) A multi-disciplinary and inter-disciplinary educational experience concerned with questions relevant to the development of black people everywhere. Development implies political, economic, social, and cultural change among other things. Consequently, a number of topics may be examined and studied.

AASP 429 Special Topics in Black Culture (3) An interdisciplinary approach to the role of black artists around the world. Emphasis is placed upon contributions of the black man in Africa, the Caribbean and the United States to the literary arts, the musical arts, the performing arts, and the visual arts. Course content will be established in terms of those ideas and concepts which reflect the cultural climate of the era in which they were produced. Attention to individual compositions and works of art through lectures, concepts, field trips, and audio-visual devices.

AEED — Agricultural and Extension Education

AEED 200 Environmental Interpretation (3) The natural history concepts and conservation practices useful for understanding natural and man-modified environments of the mid-Atlantic region. Three arranged weekend field trips.

AEED 302 Introduction to Agricultural Education (2) An overview of the job of the teacher of agriculture; examination of agricultural education programs for youth and adults.

AEED 303 Teaching Materials and Demonstrations (2) Principles and practices of the demonstration method, construction and use of visual aids in teaching agriculture.

AEED 305 Teaching Young and Adult Farmer Groups (1) Characteristics of young and adult farmer instruction in agriculture. Determining needs for and organizing a course, selecting materials for instruction, and class management. Emphasis is on the conference method of teaching.

AEED 311 Teaching Secondary Vocational Agriculture (3) A comprehensive course in the work of high school departments of vocational agriculture. It emphasizes particularly placement, supervised farming programs, the organization and administration of future farmer activities, and objectives and methods in all-day instruction.

AEED 313 Student Teaching (5) Prerequisite: satisfactory academic average and permission of instructor. Full-time student teaching in an off-campus student teaching center under an approved supervising teacher of agriculture, participating experience in all aspects of the work of a teacher of agriculture.

AEED 315 Student Teaching (1-4) Prerequisite: satisfactory academic average and permission of instructor. Full-time observation and participation in work of teacher of agriculture in off-campus student teaching center. Provides students opportunity to gain experience in the summer program of work, to participate in opening of school activities, and to gain other experience needed by teachers.

AEED 322 An Introduction to Adult and Continuing Education (3) This course introduces students to the field of nonformal adult and continuing education. It examines the social functions, studies the critical issues, explores career opportunities and surveys some of the nonformal adult education delivery systems.

AEED 323 Developing Youth Programs (3) A study of concepts involved in planning and executing programs developed to meet the needs of youth especially those living in rural and suburban areas. Emphasis will be placed on the identification of attitudes, needs, and problems of youth in all socio-economic levels. An analysis of methods or working with youth groups and developing volunteer leaders will also be included.

AEED 325 Directed Experience in Extension Education (1-5) Prerequisite: satisfactory academic average and permission of instructor. Full-time observation and participation in selected aspects of extension education in an approved training county.

AEED 327 Program Planning in Extension (3) Studies concepts involved in planning, execution and evaluation of educational programs. Students will apply the concepts while assisting with the planning and evaluation of programs. Special emphasis will also be given to extension education.

AEED 389 Selected Topics (1-3) May be repeated to a maximum of six credits provided the content is different.

AEED 398 Seminar in Agricultural Education (1) Examination of current literature, reports and discussions of problems, trends, and issues in agricultural education.

AEED 423 Extension Communications (3) An introduction to communications in teaching and within an organization, including barriers to communication, the diffusion process and the application of communication principles person to person, with groups and through mass media.

AEED 426 Development and Management of Extension Youth Programs (3) Designed for present and prospective state leaders of extension youth programs. Program development, principles of program management, leadership development and counseling.

science, career selection and citizenship in youth programs, field experience in working with youth from low income families, urban work.

AEED 427 Group Dynamics in Continuing and Extension Education (3) Concepts involved in working with groups planning extension and continuing education programs Analysis of group behavior and group dynamics related to small groups and development of a competence in the selection of appropriate methods and techniques.

AEED 464 Rural Life in Modern Society (3) Examination of the many aspects of rural life that affect and are affected by changes in technical, natural and human resources Emphasis is placed on the role which diverse organizations, agencies and institutions play in the education and adjustment of rural people to the demands of modern society

AEED 466 Rural Poverty in an Affluent Society (3) Topics examined include conditions under which people in poverty exist, factors giving rise to such conditions, problems faced by the rural poor, and the kinds of assistance they need to rise out of poverty. Topics and issues are examined in the context of rural-urban interrelationships and their effects on rural poverty. Special attention is given to past and present programs designed to alleviate poverty and to considerations and recommendations for future action.

AEED 487 Conservation of Natural Resources (3) Designed primarily for teachers Study of state's natural resources. soil, water, fisheries, wildlife, forests, and minerals natural resources problems and practices. Extensive field study Concentration on subject matter. Taken concurrently with AEED 497 in summer season.

AEED 488 Critique in Rural Education (1) Current problems and trends in rural education.

AEED 489 Field Experience (1-4) Prerequisite: consent of department Planned field experience for both major and non-major students. Repeatable to a maximum of four credits.

AEED 497 Conservation of Natural Resources (3) Designed primarily for teachers Study of state's natural resources. soil, water, fisheries, wildlife, forests, and minerals natural resources problems and practices. Extensive field study. Methods of teaching conservation included. Taken concurrently with AEED 487 in summer season.

AEED 499 Special Problems (1-3) Prerequisite: staff approval.

AGRI — Agriculture

AGRI 101 Introduction to Agriculture (1) Required of all beginning freshmen and sophomores in agriculture. Other students must get the consent of the instructor. A series of lectures introducing the student to the broad field of agriculture.

AGRI 314 Biology and Management of Finfish (4) Two lectures and two three-hour laboratories a week Prerequisite: one year of biology or zoology. Fundamentals of individual and population dynamics; theory and practice of sampling fish populations; management schemes.

AGRI 389 Internship in Natural Resources Management (3) Prerequisites: permission of instructor. Students are placed in work experiences related to their stated career goals for a minimum of eight hours a week for a semester. Each student must do an in-depth study in some portion of the work experience and produce a special project and report related to this study. A student work log is also required. This course may be repeated for a total of six credits An evaluation from the external supervisor of the project will be required.

AGRI 411 Biology and Management of Shellfish (4) Two lectures and two three-hour laboratory periods each week. Prerequsite. one year of biology or zoology Field trips Identification, biology, management, and culture of commercial important molluscs and crustacea The shellfisheries of the world, with emphasis on those of the northwestern Atlantic Ocean and the Chesapeake Bay.

AGRI 489 Special Topics in Agriculture (1-4) Credit according to time scheduled and organization of the course A lecture series organized to study in depth a selected phase of agriculture not normally associated with one of the existing programs.

AGRO — Agronomy

AGRO 100 Crops Laboratory (2) Two laboratory periods per week Demonstration and application of practices in the identification, distribution and management of field crops

AGRO 102 Crop Production (2) Prerequisite AGRO 100 or concurrent enrollment therein Culture, use, improvement, adaptation, distribution, and history of field crops.

AGRO 105 Soil and the Environment (3) A study of soils as an irreplaceable natural resource, importance of soils in the ecosystem, and analysis of land resource areas in the U S Discussion of soils as a pollutant and the pollution of soils by various agents and the role of soil as a medium for storage, decontamination or inactivation of pollutants.

AGRO 302 General Soils (4) Prerequisite CHEM 103 or permission of instructor A study of the fundamentals of soils including their origin, development, relation to natural sciences, effect on civilization, physical properties, and chemical properties

AGRO 303 International Crop Production (3) Prerequisite BOTN 100 or equivalent An introduction to the biological dimension of world hunger The problems and potentials for increasing world food supply based on current agronomic knowledge Emphasis on international aspects of food crop production and the interrelationships between agriculture and human populations in the developing world

AGRO 398 Senior Seminar (1) Reports by seniors on current scientific and practical publications pertaining to agronomy.

AGRO 403 Crop Breeding (3) Prerequisite: BOTN 414 or ZOOL 213. Principles and methods of breeding annual self and cross-pollinated plant and perennial forage species.

AGRO 404 Tobacco Production (3) Prerequisite BOTN 100. A study of the history, adaptation, distribution, culture, and improvement of various types of tobacco, with special emphasis on problems in Maryland tobacco production. Physical and chemical factors associated with yield and quality of tobacco will be stressed.

AGRO 405 Turf Management (3) Two lectures and one laboratory period per week. Prerequisite BOTN100. A study of principles and practices of managing turf for lawns, golf courses, athletic fields, playgrounds, airfields and highways for commerical sod production.

AGRO 406 Forage Crop Production (3) Prerequisites: BOTN 101, and AGRO 100, or concurrent enrollment in these courses. A general look at world grasslands; production and management requirements of major grasses and legumes for quality hay, silage and oasture for livestock feed, new cultivar development and release; seed production and distribution of improved cultivars.

AGRO 407 Cereal and Oil Crops (3) Prerequisites: BOTN 101 and AGRO 100, or concurrent enrollment in these courses. A study of principles and practices of corn, small grains, rice, millets, sorghums, and soybeans and other oil seed crops. A study of seed production, processing, distribution and federal and state seed control programs of corn, small grains and soybeans.

AGRO 411 Soil Fertility Principles (3) Prerequisite: AGRO 302 A study of the chemical, physical and biological characteristics of soils that are important in growing crops Soil deficiencies of physical, chemical, or biological nature and their correction by the use of lime, fertilizers, and rotations are discussed and illustrated

AGRO 412 Commercial Fertilizers (3) Prerequisite: AGRO 302 or permission of instructor A study of the manufacturing of commercial fertilizers and their use in soils for efficient crop production.

AGRO 413 Soil and Water Conservation (3) Two lectures and one laboratory period a week Prerequisite: AGRO 302 or permission of instructor A study of the importance and causes of soil erosion, methods of soil erosion control, and the effect of conservation practices on soil-moisture supply Special emphasis is placed on farm planning for soil and water conservation. The laboratory period will be largely devoted to field trips.

AGRO 414 Soil Classification and Geography (4) Three lectures and one laboratory period a week. Prerequisite. AGRO 302 or permission of instructor. Processes and factors of soil genesis. Taxonomy of soils of the world by U.S System Laboratory covers soil morphological characteristics, composition, classification, survey and field trips to examine and describe soils.

AGRO 415 Soil Survey and Land Use (3) Two lectures and one laboratory period a week Prerequisite AGRO 302 Evaluation of soils in the uses of land and the environmental implications of soil utilization Interpretation of soil information and soil surveys as applied to both agricultural and non-agricultural problems Incorporation of soil data into legislation, environmental standards and land use plans.

AGRO 417 Soil Physics (3) Two lectures and one laboratory period a week Prerequisite: AGRO 302 and a course in physics, or permission of instructor A study of physical properties of soils with special emphasis on relationship to soil productivity.

AGRO 421 Soil Chemistry (3) One lecture and two laboratory periods a week. Prerequisite: AGRO 302 or permission of instructor. A study of the chemical composition of soils, cation and anion exchange, acid, alkaline and saline soil conditions; and soil fixation of plant nutrients. Chemical methods of soil analysis will be studied with emphasis on their relation to fertilizer requirements.

AGRO 422 Soil Biochemistry (3) Two lectures and one laboratory period a week Prerequisite: AGRO 302, CHEM 104 or consent of instructor. A study of biochemical processes involved in the formation and decomposition of organic soil constituents. Significance of soil-biochemical processes involved in plant nutrition will be considered.

AGRO 423 Soil-Water Pollution (3) Prerequisite: AGRO 302 and CHEM 104 or permission of instructor. Reaction and fate of pesticides, agricultural fertilizers, industrial and animal wastes in soil and water with emphasis on their relation to the environment.

AGRO 451 Cropping Systems (2) Prerequisite: AGRO 102 or equivalent. The coordination of information from various courses in the development of balanced cropping systems, appropriate to differnet objectives in various areas of the state and nation.

AGRO 453 Weed Control (3) Two lectures and one laboratory per week. Prerequisite: AGRO 102 or equivalent. A study of the use of cultural practices and chemical herbicides in the control of weeds.

AGRO 499 Special Problems in Agronomy (1-3) Prerequisites: AGRO 302, 406, 407 or permission of instructor. A detailed study, including a written report of an important problem in agronomy.

AMST — American Studies

AMST 201 Introduction to American Studies I (3) Introduction to American cultural studies—past and present—by examining the concept of "self" in American autobiographical writing and the concept of "society" in accounts of various communities.

AMST 203 Popular Culture in America (3) An introduction to American popular culture, its historical development, and its role as a reflection of and influence on our culture and society.

AMST 205 Material Aspects of American Life (3) Historical survey of American material culture Ways of describing and interpreting accumulated material evidence, e g Buildings, town plans, introduced by stressing relationship between artifact and culture.

AMST 207 Contemporary American Cultures (3) World views, values, and social systems of contemporary American cultures explored through readings on selected groups such as middle-class suburbanites, old order Amish, and urban tramps.

AMST 298 Selected Topics in American Studies (3) Cultural study of a specific theme or issue involving diversified artifacts and documents from both past and contemporary American experience Course may be repeated to a maximum of six hours if the subject is different.

AMST 330 Critics of American Culture (3) Philosophies of American social purpose and promise Readings from "classical" American thinkers, contemporary social commentators, and American studies scholars.

AMST 360 Fieldwork in American Studies (3) Prerequisite. permission of instructor. Supervised field

research on the built environment, social structure, and belief systems of local groups in the College Park, Washington, or Baltimore vicinity.

AMST 398 Independent Studies (1-3) Prerequisite: permission of instructor. Provides the student with the opportunity to pursue independent, interdisciplinary research and reading in specific areas of American culture studies. May be repeated for a maximum of six credits.

AMST 418 Cultural Themes in America (3) Examination of structure and development of American culturee hrough themes such as "the dynamics of change and conflict", "culture and mental disorders","race", "ethnicity", "regionalism", "landscape", "humor". Repeatable to a maximum of six credits.

AMST 426 Culture and the Arts in America (3) Analysis of development of American cultural institutions and artifacts. Emphasis on relationship between intellectual and esthetic climate and the institutions and artifacts.

AMST 428 American Cultural Eras (3) Investigation of a decade, period, or generation as a case study in significant social change within an American context. Case studies include "Puritan dynamics in American culture, 1630-1700", "Antebellum America, 1840-1860", "American culture in the Great Depression". Repeatable to a maximum of six credits.

AMST 429 Perspectives on Popular Culture (3) Topics in popular culture studies, including the examination of particular genres, themes, and issues. Repeatable to a maximum of six credits.

AMST 432 Literature and American Society (3) Examination of the relationship between literature and society including literature as cultural communication and the institutional framework governing its production, distribution, conservation and evaluation.

AMST 450 Seminar in American Studies (3) Prerequisite: permission of instructor. Developments in theories and methods of American studies scholarship, with emphasis upon interaction between the humanities and the social sciences in the process of cultural analysis and evaluation.

AMST 498 Special Topics in American Studies (3) Prerequisite: a course in American history, literature, or government, or consent of the instructor. Topics of special interest. Repeatable to a maximum of 6 credits when topics differ.

ANSC — Animal Science

ANSC 101 Principles of Animal Science (3) Two ectures and one two-hour laboratory period per week. A comprehensive course, including the development of animal science, its contributions to the economy, characteristics of animal products, factors of efficient and economical production and distribution.

ANSC 201 Basic Principles of Animal Genetics (3) Lecture (3 credits) three lectures per week. The basic principles and laws of Mendelian genetics as applied to economically important domestic animals. Molecular genetics including DNA, RNA, genetic code and the regulation of protein synthesis. Other topics stressed include linkage and crossing over, recombination, cytological maps, chromosomal aberrations, mutations, population genetics and genetic counseling.

ANSC 203 Feeds and Feeding (3) Two lectures and one laboratory period per week. Credit not allowed for ANSC major. Prerequisites CHEM 103, 104. Elements of nutrition, source, characteristics and adaptability of the various feedstuffs to the several classes of livestock. A study of the composition of feeds, the nutrient requirements of farm animals and the formulation of economic diets and rations for livestock.

ANSC 211 Anatomy of Domestic Animals (4) Three lectures and one laboratory per week. Prerequisite: ZOOL 101. A systematic gross and microscopic comparative study of the anatomy of the major domestic animals. Special emphasis is placed on those systems important in animal production.

ANSC 212 Applied Animal Physiology (3) Prerequisite: ANSC 211 or equivalent. The physiology of domesticated animals with emphasis on functions related to production, and the physiological adaptation to environmental influences.

ANSC 214 Applied Animal Physiology Laboratory (1) One three-hour laboratory per week. Pre- or corequisite: ANSC 212. Application of physiological laboratory techniques to laboratory and domestic animals. Not open to students who have credit for ANSC 212 prior to spring 1977.

ANSC 221 Fundamentals of Animal Production (3) Two lectures and one laboratory period per week. Prerequisite: ANSC 101. The adaptation of beef cattle, sheep, swine and horses to significant and specific uses. Breeding, feeding, management practices and criteria for evaluating usefulness are emphasized.

ANSC 222 Livestock Evaluation (3) Two lectures and one laboratory period per week. Prerequisite: ANSC 221 or permission of instructor. A study of type and breed characteristics of beef cattle, sheep and swine and the market classes of livestock which best meet present day demands. One field trip of about two days duration is made during which students participate in the annual eastern intercollegiate livestock clinic.

ANSC 223 Career and Curriculum Planning Seminar (1) One meeting per week. Presentation of information relating to all specialized areas of the animal sciences with orientation toward career development and curriculum planning. Discussions and reports will be included.

ANSC 230 Light Horse Management (4) Three lectures and one two-hour laboratory period per week. Prerequisite: ANSC 101. A general course in horse management for students who intend to be involved in the care and management of light horses. The principles of nutrition, anatomy, physiology, health and disease, growth, reproduction, locomotion and basic management techniques.

ANSC 242 Dairy Production (3) Prerequisite: ANSC 101. A comprehensive course in dairy breeds, selection of dairy cattle, dairy cattle nutrients, feeding and management.

ANSC 244 Dairy Cattle Type Appraisal (1) Two laboratory periods. Freshmen, by permission of instructor. Analysis of dairy cattle type with emphasis on the comparative judging of dairy cattle.

ANSC 252 Introduction to the Diseases of Wildlife (2) Two lectures per week. Prerequisite: ZOOL 101. The principal diseases of North American wildlife will be briefly considered. For each disease, specific attention will be given to the following: signs evidenced by the affected animal or bird, causative agent, means of transmission and effects of the disease on the population of the species involved. Also included where appropriate is a consideration of the threat that each disease may pose to man or his domestic animals.

ANSC 261 Advanced Poultry Judging (1) One lecture or laboratory period per week. Prerequisite: ANSC 101. The theory and practice of judging and culling by physical means is emphasized, including correlation studies of characteristics associated with productivity. Contestants for regional collegiate judging competitions will selected from this class.

ANSC 262 Commercial Poultry Management (3) Prerequisite: ANSC 101. A symposium of finance, investment. Plant layout. Specialization, purchase of supplies and management problems in baby chick, egg, broiler and turkey production, foremanship, advertising, selling. By-products, production and financial records. Field trips required.

ANSC 265 Fundamentals of Pet Nutrition (2) Two lecture hours per week. A basic course on the nutrition of those animals commonly kept as household pets. Designed to acquaint students with minimal science background with the basic principles and techniques of animal nutrition.

ANSC 301 Advanced Livestock Evaluation (2) Two laboratory periods per week. Prerequisites: ANSC 222 and permission of instructor. An advanced course in meat animal evaluation designed to study the relationship and limitations that exist in evaluating breeding and market animals and the relationship between the live market animal and its carcass. Evaluating meat carcesses, wholesale meat cuts and meat grading will be emphasized. The most adept students enrolled in this course are chosen to represent The University of Maryland in intercollegiate judging contests.

ANSC 305 Companion Animal Care (3) Prerequisites: a semester of zoology or general biology. General information, care, and management of the companion small animals. Species covered include the cat, dog, rodents, lagomorphs, reptiles, amphibians, birds and others as class interest and schedule dictate. Basic description, evolutionary development, breeding, nutritional and environmental requirements, and public health aspects will be presented for each species.

ANSC 321 Goat Management and Diseases (3) Prerequisite: ANSC 101, 221, OR 242. Caprine biology and management including breeds, anatomy, physiology, reproduction, nutrition, lactation, diseases and surgical techniques. Special emphasis on comparing the caprine to other ruminants with respect to similarities and differences in biology, physiology and management.

ANSC 322 Rabbit Production (3) Two lectures and one two-hour laboratory per week. Prerequisite: ANSC 101 or permission of instructor. Application of animal science principles to the management and production of domestic meat-type rabbits. Occasional field trips.

ANSC 327 Principles of Breeding I (4) Three lecture hours and one two-hour discussion period per week. Prerequisite: ANSC 201. Population and quantitative genetics as applicable to domestic livestock, concepts of variation, heredity, inbreeding and relationship principles of genetic evaluation and selection for livestock improvement, breeding systems and programs. Theoretical aspects and applications.

ANSC 332 Horse Management (3) Prerequisite: ANSC 230. Major topics include nutrition, reproduction, breeding, performance evaluation, basic training and management techniques.

ANSC 337 The Science of Horse Training (2) Summer only. Prerequisites: ANSC 230, 332, and permission of instructor. Major topics include evaluation of behavioral repertory, use of positive and negative reinforcement, successive approximation, as techniques for the basic training of the horse. The basic training to include teaching an untrained horse to lunge, accept tack, drive, be mounted and perform certain movements while being ridden.

ANSC 350 Ornithology (4) Three lectures and one three-hour laboratory period per week. Three mandatory field trips. Prerequisites: ZOOL 290 or permission of instructor. Includes systematics, anatomy, physiology, behavior, life histories, ecology, population dynamics, evolution and conservation of birds. May not be taken for credit by students who have credit in ANSC 454.

ANSC 370 Animal Agriculture: Scientific and Cultural Perspectives (3) Three lectures per week. Prerequisites: one course in biological science. Study will focus on the enhancement of biological efficiency that permits more extensive options for choice of human activities, within the limitations of ecological constraints. The course examines the growth of knowledge, of both cultural and scientific origin, as applied in the development of successful human-animal systems.

ANSC 398 Seminar (1) Prerequisite: approval of the staff. Presentation and discussion of current literature and research work in animal science, or in fish and wildlife management. Repeatable to a maximum of two hours.

ANSC 399 Special Problems in Animal Science (1-2) Prerequisite: approval of staff. Work assigned in proportion to amount of credit. A course designed for advanced undergraduates in which specific problems relating to animal science will be assigned.

ANSC 401 Fundamentals of Nutrition (3) Prerequisite: CHEM 104, ANSC 212 and BCHM 261 recommended. A study of the fundamental role of all nutrients in the body including their digestion, absorption and metabolism. Dietary requirements and nutritional deficiency syndromes of laboratory and farm animals and man.

ANSC 402 Applied Animal Nutrition (3) Two lectures and one laboratory period per week. Prerequisites: MATH 110, ANSC 401 or permission of instructor. A critical study of those factors which influence the nutritional requirements of ruminants, swine and poultry. Practical feeding methods and procedures used in formulation of economically efficient rations will be presented.

ANSC 406 Environmental Physiology (3) Prerequisites: anatomy and physiology. The specific anatomical and

physiological modifications employed by animals adapted to certain stressful environments will be considered. Particular emphasis will be placed on the problems of temperature regulation and water balance. Specific areas for consideration will include animals in cold (including hibernation), animals in dry heat, diving animals and animals in high altitudes.

ANSC 407 Advanced Dairy Production (1) An advanced course primarily designed for teachers of vocational agriculture and county agents. It includes a study of the newer discoveries in dairy cattle nutrition, breeding and management.

ANSC 412 Introduction to Diseases of Animals (3) Two lectures and one laboratory period per week. Prerequisite: MICB 200 and ZOOL 101. This course gives basic instruction in the nature of disease including causation, immunity, methods of diagnosis, economic importance, public health aspects and prevention and control of the common diseases of sheep, cattle, swine, horses and poultry.

ANSC 413 Laboratory Animal Management (3) A comprehensive course in care and management of laboratory animals. Emphasis will be placed on physiology, anatomy and special uses for the different species. Disease prevention and regulations for maintaining animal colonies will be covered. Field trips will be required.

ANSC 415 Parasitic Diseases of Domestic Animals (3) Two lectures and one laboratory per week. Prerequisite: ANSC 412 or equivalent. A study of parasitic diseases resulting from protozoan and Helminth infection and arthropod infestation. Emphasis on parasites of veterinary importance their identification, life cycles, pathological effects and control by management.

ANSC 416 Wildlife Management (3) Two lectures and one laboratory. An introduction to the interrelationships of game birds and mammals with their environment, population dynamics and the principles of wildlife management.

ANSC 421 Swine Production (3) Two hours of lecture and four hours of laboratory per week. Prerequisites: ANSC 101, 221, and ANSC 203 or 401. A study of swine production systems including the principles of animal science for the efficient and economical management of swine breeding, feeding, reproduction and marketing.

ANSC 422 Meats (3) Two lectures and one laboratory period per week. Prerequisite: ANSC 221. A course designed to give the basic facts about meat as a food and the factors influencing acceptability, marketing, and quality of fresh meats. It includes comparisons of characteristics of live animals with their carcasses, grading and evaluating carcasses as well as wholesale cuts, and the distribution and merchandising of the nation's meat supply. Laboratory periods are conducted in packing houses, meat distribution centers, retail outlets and University Meats Laboratory.

ANSC 423 Beef Production (3) One lecture and two laboratory periods per week. Prerequisite: ANSC 401. Application of various phases of animal science to the management and production of beef cattle, sheep and swine.

ANSC 424 Sheep Production (3) Two hours of lecture and four hours of laboratory per week. Prerequisites: ANSC 101, ANSC 221, and ANSC 203 or 401. A study of sheep production systems including the principles of animal science for the efficient and economical management of sheep breeding, feeding, reproduction and marketing.

ANSC 425 Herpetology (3) Two hours of lecture and four hours of laboratory per week. Prerequisites: ANSC 101, ANSC 221, and ANSC 203 or 401. A study of beef production systems including the principles of animal science for the efficient and economical management of beef breeding, feeding, reproduction and marketing.

ANSC 427 Principles of Breeding II (3) Prerequisites: ANSC 327 and BIOM 401 or permission of instructor. Advanced theory of quantitive and population genetics applicable to the artificial evolution of domestic livestock.

ANSC 430 Topics in Equine Science (4) Three lectures and one two-hour discussion period per week. Prerequisites: ANSC 211, 212, 230. Pre- or corequisite, ANSC 401. Specific problems of importance to the equine industry, including such areas as nutrition, physiology, anatomy, genetics and pathology.

ANSC 431 Horse Production (2) One lecture and one two-hour laboratory per week. Laboratory and assigned project to be performed at University of Maryland Horse Farm, Ellicott City, Md. Prerequisite: ANSC 101, 210, 211, 230 and consent of department. Field trips. Application of equine science principles to the management and production of horses.

ANSC 432 Breeding Farm Management (2) One lecture and one two-hour laboratory per week. Prerequisite: ANSC 211, 212, 230 and consent of department. Animal equine science principles in the management of equine breeding establishments. Field trips.

ANSC 443 Physiology and Biochemistry of Lactation (3) Prerequisites: ANSC 212 or equivalent and CHEM 261 or CHEM 461. Three lectures per week. The physiology and biochemistry of milk production in domestic animals, particularly cattle. Mammary gland development and maintenance from the embryo to the fully developed lactating gland. Abnormalities of the mammary gland.

ANSC 444 Analysis of Dairy Production Systems (3) Prerequisites: AREC 406 and ANSC 203 or 214, or permission of instructor. The business aspects of dairy farming including an evaluation of the costs and returns associated with each segment. The economic impact of pertinent management decisions is studied. Recent developments in animal nutrition and genetics, agricultural economics, agricultural engineering, and agronomic practices are discussed as they apply to management of a dairy herd.

ANSC 446 Physiology of Mammalian Reproduction (3) Prerequisite: ZOOL 422 or ANSC 212. Anatomy and physiology of reproductive processes in domesticated and wild mammals.

ANSC 447 Physiology of Mammalian Reproduction Laboratory (1) Pre- or corequisites: ANSC 446. One three-hour laboratory per week. Animal handling, artificial insemination procedures and analytical techniques useful in animal management and reproductive research. Not open to students who have credit for ANSC 446 prior to fall 1976.

ANSC 452 Avian Physiology (2) (Alternate even years) one three-hour laboratory period per week. Prerequisites: a basic course in animal physiology. The basic physiology of the bird is discussed, excluding the reproductive system. Special emphasis is given to physiological differences between birds and other vertebrates.

ANSC 462 Physiology of Hatchability (1) Two lectures and one laboratory period per week. Prerequisite: ZOOL 421 or 422. The physiology of embryonic development as related to principles of hatchability and problems of incubation encountered in the hatchery industry are discussed.

ANSC 463 Nutrition Laboratory (2) Prerequisite: ANSC 401/NUSC 402 or concurrent registration. Six hours of laboratory per week. Digestibility studies with ruminant and monogastric animals, proximate analysis of various food products, and feeding trials demonstrating classical nutritional deficiencies in laboratory animals.

ANSC 464 Poultry Hygiene (3) Two lectures and one laboratory period per week. Prerequisites: MICB 200 and ANSC 101. Virus, bacterial and protozoan diseases, parasitic diseases, prevention, control and eradication.

ANSC 466 Avian Anatomy (3) Two lectures and one laboratory period per week. Prerequisite: ZOOL 210. Gross and microscopic structure, dissection and demonstration.

ANSC 467 Poultry Breeding and Feeding (1) This course is designed primarily for teachers of vocational agriculture and extension service workers. The first half will be devoted to problems concerning breeding and the development of breeding stock. The second half will be devoted to nutrition.

ANSC 477 Poultry Products and Marketing (1) This course is designed primarily for teachers of vocational agriculture and county agents. It deals with the factors affecting the quality of poultry products and with hatchery management problems, egg and poultry grading, preservation problems and market outlets for Maryland poultry.

ANSC 480 Special Topics in Fish and Wildlife Management (3) Three lectures. Analysis of various state and federal programs related to fish and wildlife management. This would include fish stocking programs, Maryland deer management program, warm water fish management, acid drainage problems, water quality, water fowl management, wild turkey management and regulations relative to the administration of these programs.

ANSC 487 Special Topics in Animal Science (1) Prerequisite: permission of instructor. This course is designed primarily for teachers of vocational agriculture and extension service personnel. One primary topic to be selected mutually by the instructor and students will be presented each session.

ANTH — Anthropology

ANTH 101 Introduction to Anthropology: Archaeology and Physical Anthropology (3) May be taken for credit in the general education program. General patterns of the development of human culture; the biological and morphological aspects of man viewed in his cultural setting.

ANTH 102 Introduction to Anthropology: Cultural Anthropology and Linguistics (3) Social and cultural principles as exemplified in ethnographic descriptions. The study of language within the context of anthropology.

ANTH 103 Introduction to Primate Social Behavior (3) An introduction of the primate socialization process as evidenced in the prosimians, monkeys, apes and humans. Social organization, function and ecology will be stressed within the framework of modern ethology.

ANTH 221 Man and Environment (3) A geographical introduction to ethnology, emphasizing the relations between cultural forms and natural environment.

ANTH 241 Introduction to Archaeology (3) A survey of the basic aims and methods of archeological field work and interpretation, with emphasis on the reconstruction of prehistoric ways of life.

ANTH 261 Introduction to Physical Anthropology (3) The biological evolution of man, including the process of race formation, as revealed by the study of the fossil record and observation of modern forms.

ANTH 271 Language and Culture (3) A non-technical introduction to linguistics, with special consideration of the relations between language and other aspects of culture. (Listed also as HESP 121).

ANTH 298 Special Topics in Anthropology (3) Anthropological perspectives on selected topics of broad general interest. Course may be repeated to a maximum of six credits when course content differs.

ANTH 361 Human Evolution and Fossil Man (3) A survey of the basic principles of human evolution as seen by comparative anatomic study of fossil specimens.

ANTH 371 Introduction to Linguistics (3) Introduction to the basic concepts of modern descriptive linguistics. Phonology, morphology, syntax. Examinations of the methods of comparative linguistics, internal reconstruction, dialect geography.

ANTH 389 Research Problems (1-6) Prerequisite: permission of instructor. Introductory training in anthropological research methods. The student will prepare a paper embodying the results of an appropriate combination of research techniques applied to a selected problem in any field of anthropology.

ANTH 397 Anthropological Theory (3) Prerequisite: permission of instructor. A survey of the historical development and current emphasis in the theoretical approaches of all fields of anthropology, providing an integrated frame of reference for the discipline as a whole.

ANTH 401 Cultural Anthropology: Principles and Processes (3) Prerequisite: ANTH 101, 102, or 221. An examination of the nature of human culture and its processes, both historical and functional. The approach will be topical and theoretical rather than descriptive.

ANTH 402 Cultural Anthropology: World Ethnography (3) Prerequisite: ANTH 101, 102, or 221. A descriptive survey of the culture areas of the world through an examination of the ways of selected representative societies.

ANTH 412 Peoples and Cultures of Oceania (3) A survey of the cultures of Polynesia, Micronesia, Melanesia and Australia. Theoretical and cultural-historical problems will be emphasized.

ANTH 414 Ethnology of Africa (3) Prerequisites: ANTH 101 and 102. The native peoples and cultures of Africa and their historical relationships, with emphasis on that portion of the continent south of the Sahara.

ANTH 417 Peoples and Cultures of the Far East (3) A survey of the major sociopolitical systems of China, Korea and Japan. Major anthropological questions will be dealt with in presenting this material.

ANTH 423 Ethnology of the Southwest (3) Prerequisites: ANTH 101 and 102. Culture history, economic and social institutions, religion, and mythology of the Indians of the southwest United States.

ANTH 424 Ethnology of North America (3) Prerequisites: ANTH 101 and 102. The native people and cultures of North America north of Mexico and their historical relationships, including the effects of contact with European-derived populations.

ANTH 426 Ethnology of Middle America (3) Prerequisites: ANTH 101 and 102. Cultural background and modern social, economic and religious life of Indian and Mestizo groups in Mexico and central America; processes of acculturation and currents in cultural development.

ANTH 431 Social Organization of Primitive Peoples (3) Prerequisites: ANTH 101 and 102. A comparative survey of the structures of non-literate and folk societies, covering both general principles and special regional developments.

ANTH 434 Religion of Primitive Peoples (3) Prerequisites: ANTH 101 and 102. A survey of the religious systems of primitive and folk societies, with emphasis on the relation of religion to other aspects of culture.

ANTH 436 Primitive Technology and Economy (3) A survey of technology, food economy and general economic processes in non-industrial societies.

ANTH 437 Politics and Government in Primitive Society (3) A combined survey of politics in human societies and of important anthropological theories concerning this aspect of society.

ANTH 441 Archaeology of the Old World (3) Prerequisite: ANTH 101 or 241. A survey of the archaeological materials of Europe, Asia and Africa, with emphasis on chronological and regional interrelationships.

ANTH 451 Archaeology of the New World (3) Prerequisite: ANTH 101 or 241. A survey of the archaeological materials of North and South America with emphasis on chronological and regional interrelationships.

ANTH 461 Human Osteology Laboratory (3) Prerequisite: ANTH 101. A laboratory study of the human skeleton, its morphology, measurement, and anatomic relationships.

ANTH 462 Primate Anatomy Laboratory (3) Prerequisite: ANTH 101. The gross anatomy of non-human primates. Laboratory dissection of various primate cadavers under supervision. Occasional lectures.

ANTH 463 Primate Studies (3) Prerequisite: ANTH 101. A combination lecture and laboratory examination of non-human primates. Major studies of various types that have been undertaken in the laboratory and in the field.

ANTH 465 Human Growth and Constitution (3) Prerequisite: ANTH 101. A laboratory study of the growth, development and age changes in the human body from conception through old age, including gross photographic, radiographic, and microscopic study of growth and variation.

ANTH 466 Forensic Anthropology Laboratory (3) Prerequisite: ANTH 461 or permission of the instructor. A laboratory study of the methods used to identify human remains by anthropological techniques and discussion of the role of the anthropologist in medico-legal investigation.

ANTH 467 Human Population Biology Laboratory (3) Prerequisite: ANTH 101. A laboratory study of human population genetics, dynamics and variation, including anthropological serology, biochemistry, dermatoglyphics and hair microscopy.

ANTH 498 Field Methods in Ethnology (1-6) Field training in the collection and recording of ethnological data.

ANTH 499 Field Methods in Archaeology (1-6) Field training in the techniques of archaeological survey and excavation.

APDS — Applied Design

APDS 101 Fundamentals of Design (3) Knowledge of basic art elements and principles gained through design problems which employ a variety of media.

APDS 102 Design II (3) Prerequisite: APDS 101. Continued exploration of design as a means of visual expression with added emphasis on color and lighting.

APDS 103 Design III: Three-dimensional Design (3) Pre- or corequisite: APDS 102. Creative efforts directed to discriminating use of form, volume, depth, and movement.

APDS 104 Survey of Design History (3) A general introduction to, and historical development of, the design fields from 1850 to the present. Examination of the influence of design on our lives and our environment, with emphasis on western culture.

APDS 210 Presentation Techniques (3) Three studio periods. Prerequisites: APDS 101, 102 or equivalent. Comparative approach to basic presentation techniques used in the several areas of commercial design.

APDS 211 Action Drawing: Fashion Sketching (3) Three studio periods. Prerequisites: APDS 101 and consent of instructor. Study of the balance and proportion of the human figure. Sketch techniques applied to action poses and fashion drawing in soft and lithograph pencils, pastels, water color, ink. Drawing from model.

APDS 212 Design Workshop For Transfers (5) Prerequisite: APDS 101 or equivalent. Provides opportunity for transfer students to remove deficiences in lower-level design courses. Study of color, lighting and presentation techniques. May be taken no later than one semester after transfer into department.

APDS 237 Photography (3) One lecture, two hours studio and two hours of photo laboratory per week. Prerequisites: APDS 101, 102, or equivalent. Study of fundamental camera techniques. Exploration of the expressive possibilities in relation to the field of design and visual communication.

APDS 320 Fashion Illustration (3) First semester. Three studio periods. Prerequisites: APDS 101, 102, 103, 210, 211. Fabric and clothing structure as they relate to illustration. Opportunity to explore rendering styles and techniques appropriate to reproduction methods currently used in advertising. Guidance in development of individuality in presentations.

APDS 330 Typography and Lettering (3) Three studio periods. Prerequisites: APDS 101, 102. Experience in hand lettering techniques as a means of understanding lettering styles in design composition. Recognition of type faces used in advertisement, book and magazine layout. Effect of printing processes on design choices.

APDS 331 Advertising Layout (3) Three studio periods. Prerequisites: APDS 330, EDIT 160. Design of advertising layouts from initial idea to finished layout. Typography and illustration as they relate to reproduction processes used in direct advertising.

APDS 332 Display Design (3) Three studio periods. Prerequisites: EDIT 160, APDS 330 or equivalent. Application of design principles to creative display appropriate to exhibits, design shows, merchandising. Display construction.

APDS 337 Advanced Photography (3) Two two-hour studio periods plus two hours of photo laboratory per week. Prerequisite: APDS 237. Composition techniques and lighting applicable to illustration, documentation, advertising design, and display.

APDS 380 Professional Seminar (2) Two lecture-discussion periods. Prerequisite: junior standing and consent of instructor. Exploration of professional and career opportunities, ethics, practices. Professional organizations. Portfolio evaluation.

APDS 430 Advanced Problems in Advertising Design (3) Two studio periods. Prerequisite: APDS 331. Advanced problems in design and layout planned for developing competency in one or more areas of advertising design.

APDS 431 Advanced Problems in Advertising Design (3) Two studio periods. Prerequisite: APDS 430. Advanced problems in design and layout planned for developing competency in one or more areas of advertising design.

APDS 437 Advanced Photography (3) Three studio periods. Continuation of APDS 337.

APDS 499 Individual Problems in Applied Design (3-4) Written consent of instructor. Open only to advanced students who, with guidance, can work independently.

ARCH — Architecture

ARCH 170 Introduction to the Built Environment (3) Introduction to conceptual, perceptual, behavioral and technical aspects of environmental design, methods of analysis, problem solving and project implementation.

ARCH 217 Technology, Human Settlements, and Shelter (3) A survey of developments in technology through history and their impacts and influences on the form and fabric of human settlements and shelter. Emphasis on the technologies most relative to examples of buildings in cities in North America and Europe.

ARCH 222 History of Western Architecture (3) Prerequisite: ARCH 170 or permission of instructor. Survey of the major monuments and styles of western architectural history from the ancient world to the twentieth century. Not available for credit to students who have taken ARCH 220 or ARCH 221. Not available for credit to students who have taken ARTH 340 or ARTH 341.

ARCH 240 Basic Photography (3) One and one-half hours lecture and four hours laboratory per week. Introduction to black and white cameras and darkroom techniques with emphasis on the role of craft decisions in photographic communication. Architectural applications. Architecture students only, except by permission of instructor.

ARCH 242 Drawing I (2) Introduces the student to basic techniques of sketching and use of various media.

ARCH 250 Survey of Urban Planning (3) A survey of urban development and planning, ancient through modern cities, focus on the roots of modern planning in 19th and 20th century England and America; study of a planning issue in the Baltimore-Washington Metropolitan area.

ARCH 302 Architecture Studio I (6) Three hours of lecture and nine hours of studio per week. Introduction to the processes of visual and architectural design including field problems. For architecture majors only.

ARCH 303 Architecture Studio II (6) Three hours of lecture and nine hours of studio per week. Prerequisite: ARCH 302 with a grade of C or better. Continuation of ARCH 302. For architecture majors only.

ARCH 312 Architectural Structures I (3) Prerequisites: MATH 220 and PHYS 121. For architecture majors only. Principles of behavior displayed in architectural structural systems, elements and materials; equilibrium and stability, distribution of forces and stresses, strength and stiffness. Resolutions of forces, reactions, movements, shears, deflection, and buckling of systems and elements.

ARCH 313 Thermal and Acoustical Technology in Buildings (3) Prerequisites: MATH 115 and PHYS 122. For architecture majors only. Theory, quantification and architectural design applications for thermal comfort, HVAC and mechanical systems and acoustics.

ARCH 343 Drawing II: Line Drawing (2) Studio, 4 hours per week. Prerequisite: ARCH 302 or permission of instructor. Basic free hand line drawing for architectural perception and design.

ARCH 352 The Architect in the Community (3) The architect's role in the social and political dynamics of urban environmental design decision-making processes, including study of determination and expression of user needs, community aspirations, formal and informal program and design review processes. Seminar, 1 hour per week, field observation, approximately 3 hours per

week

ARCH 372 Signs, Symbols and Messages in Architecture (3) Limited to architecture students or by permission of the instructor. Class limited to 15-20 students. Signs and symbols in buildings and cities, messages conveyed and purposes for conveying these messages. Readings, photographic reports and minor problem-solving assignments. Lecture, three hours per week.

ARCH 375 Architectural Construction and Materials (3) For architecture majors only. Construction processes of building, related terminology; review of primary building materials, physical characteristics, use and performance of materials as related to environmental forces.

ARCH 376 The Architectural Program As Functional Form Generator (3) A study of architectural programming as derived from functional needs of man in his environment. Analysis, synthesis and evaluation of categories of needs with concentration on human response to forms generated by programs with emphasis on non-quantifiable human needs. Architecture majors or by permission of the instructor. Lectures, seminars, field trips, 3 hours per week.

ARCH 402 Architecture Studio III (6) Three hours of lecture and nine hours of studio per week. Prerequisite: ARCH 303 with a grade of C or better. Design projects involving the elements of environmental control, basic structural systems, building processes and materials. For architecture majors only.

ARCH 403 Architecture Studio IV (6) Three hours of lecture and nine hours of studio per week. Prerequisite: ARCH 402 with a grade of C or better. Design projects involving forms generated by different structural systems, environmental controls and methods of construction. For architecture majors only.

ARCH 408 Selected Topics in Architecture Studio (1-6) Prerequisite: ARCH 403, or equivalent, and permission of instructor. Topical problems in architecture and urban design. Repeatable to a maximum of 6 credits provided the content is different.

ARCH 412 Architectural Structures II (3) Prerequisite: ARCH 312. Design of steel, timber, and reinforced concrete elements, and subsystems; analysis of architectural building systems. Introduction to design for both natural and man-made hazards.

ARCH 414 Solar Energy Applications For Buildings (3) Prerequisite: ARCH 313 or permission of instructor. Methods of utilizing solar energy to provide heating, cooling, hot water, and electricity for buildings and related techniques for reducing energy consumption.

ARCH 415 Illumination, Electrical and Systems Technology in Buildings (3) Prerequisites: MATH 115 and PHYS 122. For architecture majors only. Theory, quantification, and architectural design applications for electrical systems, illumination, daylighting, communication systems, conveying systems, fire protection and plumbing.

ARCH 416 Advanced Architectural Structures (3) Prerequisites: ARCH 403 and ARCH 412. Analysis of structural issues in architectural design; structure as an architectural form determinant; integration of architectural, structural and other technical disciplines in building design.

ARCH 417 Advanced Environmental Technology in Buildings (3) Prerequisites: ARCH 403, 313, and 415. Analysis of environmental technology issues in architectural design; mechanical systems, illumination and acoustics as architectural form determinants; integration of environmental technology systems and related technical disciplines in building design.

ARCH 418 Selected Topics in Architectural Science (1-4) Prerequisite: consent of instructor. Repeatable to a maximum of 7 credits, provided content is different.

ARCH 419 Independent Studies in Architectural Science (1-4) Proposed work must have a faculty sponsor and receive approval of the curriculum committee. Repeatable to a maximum of 7 credits.

ARCH 420 History of American Architecture (3) Prerequisite: ARCH 221 or permission of instructor. American architecture from the late 17th to the 20th century.

ARCH 421 Seminar in the History of American Architecture (3) Prerequisite: ARCH 420 or permission of instructor. Advanced investigation of historical problems in American architecture.

ARCH 422 History of Greek Architecture (3) Prerequisite: ARCH 222 or permission of the instructor. Survey of Greek architecture from 750-100 B.C.

ARCH 423 History of Roman Architecture (3) Prerequisite: ARCH 222 or permission of the instructor. Survey of Roman architecture from 500 B.C. To A.D. 325

ARCH 424 History of Russian Architecture (3) Prerequisite: ARCH 221, or permission of instructor. Major trends in Russian architecture in the medieval (10th - 17th centuries), Imperial (1703 - 1917), and Soviet periods.

ARCH 427 Theories of Architecture (3) Prerequisite: ARCH 221, or permission of instructor. Selected historical and modern theories of architectural design. For architecture majors only.

ARCH 428 Selected Topics in Architectural History (1-3) Prerequisite: consent of instructor. Repeatable to a maximum of 7 credits, provided the content is different.

ARCH 429 Independent Studies in Architectural History (1-4) Proposed work must have a faculty sponsor and receive approval of the curriculum committee. Repeatable to a maximum of 6 credits.

ARCH 432 History of Medievel Architecture (3) Prerequisite: ARCH 221, or permission of instructor. Architecture of western Europe from the early Christian and Byzantine periods through the late Gothic, with consideration of parallel developments in the eastern world.

ARCH 433 History of Renaissance Architecture (3) Prerequisite: ARCH 221, or permission of instructor. Renaisssance architectural principles and trends in the 15th and 16th centuries and their modifications in the Baroque period.

ARCH 434 History of Modern Architecture (3) Prerequisite: ARCH 221, or permission of instructor. Architectural trends and principles from 1750 to the present, with emphasis on developments since the mid-19th century.

ARCH 435 Seminar in the History of Modern Architecture (3) Prerequisite: ARCH 434 or permission of instructor. Advanced investigation of historical problems in modern architecture.

ARCH 436 History of Islamic Architecture (3) Survey of Islamic architecture from the seventh through the eighteenth century.

ARCH 437 History of Pre-Columbian Architecture (3) Architecture of Pre-Columbian Mexico and Central America from the Pre-Classic Period through the Spanish conquest.

ARCH 442 Studies in Visual Design (3) Prerequisite: ARCH 303. Studio work in visual design independent of architectural problem solving.

ARCH 443 The Photography of Architecture (3) One and one-half hours lecture and four hours laboratory per week. Prerequisite: ARCH 344. Examination of the meaning of documentation and the use of photography in the evaluation of architecture. Architecture students only, except by permission of the instructor.

ARCH 445 Visual Analysis of Architecture (3) Two hours of lecture and two hours of studio per week. Prerequisite: ARCH 303 and ARCH 343, or permission of the instructor. Visual principles of architectural design through graphic analysis.

ARCH 447 Advanced Seminar in Photography (3) Prerequisites: ARCH 340 or APDS 337 or JOUR 351; and consent of instructor. Advanced study of photographic criticism through empirical methods, for students proficient in photographic skills. Photographic assignments, laboratory, seminar, 3 hours per week.

ARCH 448 Selected Topics in Visual Studies (1-4) Prerequisite: consent of instructor. Repeatable to a maximum of 7 credits, provided the content is different.

ARCH 449 Independent Studies in Visual Studies (1-4) Proposed work must have a faculty sponsor and receive approval of the curriculum committee. Repeatable to a maximum of 6 credits.

ARCH 450 Introduction to Urban Planning (3) Introduction to city planning theory, methodology and techniques, dealing with normative, urban, structural, economic, social aspects of the city, urban planning as a process. Architectural majors or by permission of the instructor. Lecture, seminar, 3 hours per week.

ARCH 451 Urban Design Seminar (3) Prerequisite: ARCH 350 or permission of the instructor. Advanced investigation into problems of analysis and evaluation of the design of urban areas, spaces and complexes with emphasis on physical and social considerations, effects of public policies, through case studies. Field observations.

ARCH 453 Urban Problems Seminar (3) Prerequisite: permission of instructor. A case study of urban development issues, dealing primarily with socio-economic aspects of changes in the built environment.

ARCH 454 Theories of Urban Form (3) Theories of planning and design of urban spaces, building complexes, and new communities.

ARCH 458 Selected Topics in Urban Planning (1-4) Prerequisite: consent of instructor. Repeatable to a maximum of 7 credits, provided the content is different.

ARCH 459 Independent Studies in Urban Planning (1-4) Proposed work must have a faculty sponsor and receive approval of the curriculum committee. Repeatable to a maximum of 6 credits.

ARCH 460 Site Analysis and Design (3) Principles and methods of site analysis; the influence of natural and man-made site factors on site design and architectural form. For architecture majors only, or by permission of instructor.

ARCH 461 Design and Energy (3) Prerequisite: ARCH 402 and ARCH 415. Two hours of seminar, two hours of laboratory each week. Energy strategies in building related to the broader context of architectural problem solving.

ARCH 470 Computer Applications in Architecture (3) Prerequisite: ARCH 302 or permission of instructor. Introduction to computer programming and utilization, with emphasis on architectural applications.

ARCH 472 Economic Determinants in Architecture (3) Introduction to economic factors influencing architectural form and design, including land economics, real estate, financing, project development, financial planning, construction and cost control.

ARCH 475 Advanced Architectural Construction and Materials (3) Prerequisites: ARCH 375 and 403. Processes of construction, assembly, integration, and coordination of architectural, mechanical, electrical, and structural aspects of building; special attention to design development of building details.

ARCH 478 Selected Topics in Architecture (1-4) Prerequisite: consent of instructor. Repeatable to a maximum of 7 credits, provided the content is different.

ARCH 479 Independent Studies in Architecture (1-4) Proposed work must have a faculty sponsor and receive approval of the curriculum committee. Repeatable to a maximum of 6 credits.

ARCH 480 Problems and Methods of Architectural Preservation (3) Prerequisite: ARCH 420 or permission of instructor. Theory and practice of preservation in America, with emphasis on the problems and techniques of community preservation.

ARCH 481 The Architect in Archaeology (3) Prerequisite: consent of instructor. The role of the architect in field archaeology and the analysis of excavating, recording, and publishing selected archaeological expeditions.

ARCH 482 The Archaeology of Roman and Byzantine Palestine (3) Archaeological sites in Palestine (Isreal and Jordan) from the reign of Herod the Great to the Moslem conquest.

ARCH 483 Field Archaeology (3) Prerequisite: consent of the instructor. Participation in field archaeology with an excavation officially recognized by proper authorities of local government.

ARCH 488 Selected Topics in Architectural Preservation (1-4) Prerequisite: consent of instructor. Repeatable to a maximum of seven credits, provided the content is different.

ARCH 489 Independent Studies in Architectural Preservation (1-4) Proposed work must have a faculty sponsor and receive approval of the curriculum committee. Repeatable to a maximum of 6 credits.

AREC — Agriculture and Resource Economics

AREC 227 Marketing Agricultural Products (3) The development of marketing, its scope, channels, and agencies of distribution, functions, costs, methods used and services rendered.

AREC 240 Environment and Human Ecology (3) Costs and social impacts of pollution and human crowding in the modern environment. The economic, legal and institutional causes of these problems. Public policy approaches to solutions and the costs and benefits of alternative solutions.

AREC 250 Elements of Agricultural and Resource Economics (3) An introduction to economic principles of production, marketing, agricultural prices and incomes, farm labor, credit, agricultural policies, and government programs.

AREC 306 Farm Management (3) The organization and operation of the farm business to obtain an income consistent with family resources and objectives. Principles of production economics and other related fields as applied to the individual farm business. Laboratory period will be largely devoted to field trips and other practical exercises.

AREC 310 Horse Industry Economics (3) Prerequisite: ANSC 230 and 332. An introduction to the economic forces affecting the horse industry and to the economic tools required by horse farm managers, trainers, and others in the industry.

AREC 353 Land Resource Economics (3) A study of the adequacy and quality of the natural (land, water, air) and human resources, the economic and institutional arrangements which guide their use and development, and the means for improving their quality and use.

AREC 365 World Hunger, Population, and Food Supplies (3) An introduction to the problem of world hunger and possible solutions to it. World demand, supply, and distribution of food. Alternatives for leveling off world food demand, increasing the supply of food, and improving its distribution. Environmental limitations to increasing world food production.

AREC 398 Seminar (1) Students will obtain experience in the selection, Preparation and presentation of economic topics and problems which will be subjected to critical analysis.

AREC 399 Special Problems (1-2) Concentrated reading and study in some phase of problem in agricultural economics.

AREC 404 Prices of Agricultural Products (3) Prerequisite: ECON 403. An introduction to agricultural price behavior. The use of price information in the decision-making process, the relation of supply and demand in determining agricultural prices, and the relation of prices to grade, time, location, and stages of processing in the marketing system. Elementary methods of price analysis, the concept of parity and the role of price support programs in agricultural decisions.

AREC 405 Economics of Agricultural Production (3) Prerequisites: ECON 403 and MATH 220. The use and application of production economics in agriculture and resource industries through graphical and mathematical approaches. Production functions, cost functions, multiple product and joint production, and production processes through time.

AREC 407 Agricultural Finance (3) Prerequisite: AREC 250. Application of economic principles to develop criteria for a sound farm business, including credit source and use; preparing and filing income tax returns; methods of appraising farm properties; the summary and analysis of farm records, leading to effective control and profitable operation of the farm business.

AREC 414 Agricultural Business Management (3) Prerequisite: AREC 250. The different forms of businesses. Management functions, business indicators, measures of performance, and operational analysis. Case studies are used to show applications of management techniques.

AREC 427 Economics of Agricultural Marketing Systems (3) Prerequisite: AREC 250. Basic economic theory as applied to the marketing of agricultural products, including price, cost, and financial analysis. Current developments affecting market structure including effects of contractual arrangement, vertical integration, governmental policies and regulation.

AREC 432 Introduction to Natural Resources Policy (3) Development of natural resource policy and analysis of the evolution of public intervention in the use of natural resources. Examination of present policies and of conflicts between private individuals, public interest groups, and government agencies.

AREC 433 Food and Agricultural Policy (3) Prerequisite: AREC 250. Economic and political context of governmental involvement in the farm and food sector. Historical programs and current policy issues. Analysis of economic effects of agricultural programs, their benefits and costs, and comparison of policy alternatives. Analyzes the interrelationship among international development, agricultural trade and general economic and domestic agricultural policies.

AREC 445 World Agricultural Development and the Quality of Life (3) Prerequisite: AREC 250. An examination of the key aspects of the agricultural development of less developed countries related to resources, technology, cultural and social setting, population, infrastructure, incentives, education, and government. Environmental impact of agricultural development, basic economic and social characteristics of peasant agriculture, theories and models of agricultural development, selected aspects of agricultural development planning.

AREC 453 Natural Resources and Public Policy (3) Prerequisites: AREC 250 or ECON 203. Rational use and reuse of natural resources. Theory, methodology, and policies concerned with the allocation of natural resources among alternative uses. Optimum state of conservation, market failure, safe minimum standard, and cost-benefit analysis.

AREC 484 Introduction to Econometrics in Agriculture (3) An introduction to the application of econometric techniques to agricultural problems with emphasis on the assumptions and computational techniques necessary to derive statistical estimates, test hypotheses, and make predictions with the use of single equation models. Includes linear and non-linear regression models, internal least squares, discriminant analysis and factor analysis.

AREC 489 Special Topics in Agricultural and Resources Economics (3) Repeatable to a maximum of 9 credits.

AREC 495 Honors Reading Course in Agricultural and Resource Economics I (3) Selected readings in political and economic theory from 1700 to 1850. This course develops a basic understanding of the development of economic and political thought as a foundation for understanding our present society and its cultural heritage. Prerequisite acceptance in the honors program of the department of agricultural and resource economics.

AREC 496 Honors Reading Course in Agricultural and Resource Economics II (3) Selected readings in political and economic theory from 1850 to the present. This couse continues the development of a basic understanding of economic and political thought begun in AREC 495 by the examination of modern problems in agricultural and resource economics in the light of the material read and discussed in AREC 495 and AREC 496. Prerequisite successful completion of AREC 495 and registration in the honors program of the department and resource economics.

ARHU — Arts and Humanities

ARHU 308 Critical Eras: An Interdisciplinary View (3) An interdisciplinary exploration of a critical period, ranging from a year to an era, stressing the relationship between different forms of human expression and the social milieu. Repeatable to a maximum of six hours.

ARHU 309 Forms and Forces of Human Experience: An Interdisciplinary Exploration (3) Prerequisite: one course in at least one of the departments participating in the particular section. An interdisciplinary analysis of a particular social or cultural topic, attitude, or concern. Repeatable to a maximum of six credits.

ARHU 318 Cross-Cultural Analysis of Human Questions: An Interdisciplinary Approach (3) Prerequisite: one course in at least one of the departments participating in the particular section. An interdisciplinary analysis of a selected social or cultural topic, attitude or concern in two or more cultures. Repeatable to a maximum of six credits.

ARHU 319 Human Understanding in Interdisciplinary Perspective (3) Prerequisite: one course in at least one of the departments participating in the particular section. An interdisciplinary analysis of the methodology of humanistic knowledge and aesthetic expression, and of the assumptions underlying differing interpretations. Repeatable to a maximum of six credits.

ARSC — Air Science

ARSC 100 The Air Force Today I (1) One hour class and one hour laboratory per week. Study of U.S. Air Force in contemporary society. Survey of Air Force doctrine, mission, organization and systems. Freshman course for AFROTC Cadets. Open to all university students.

ARSC 101 The Air Force Today II (1) Continuation of ARSC 100. The mission, organization and systems of U.S. Air Force offensive, defensive, and aerospace support forces and the use of these forces to support contemporary societal demands. Freshman year course for AFROTC cadets. Open to all university students.

ARSC 110 Fundamentals of Flying (1) A study of basic aviation knowledge for the beginning student pilot. The basic principles of flight, simple aerodynamics, a description of aircraft systems and flight instruments, federal aviation regulations, basic meteorology, the use of the flight computer for simple flight computations and visual flight operations (VFR).

ARSC 200 The Development of Air Power I (1) Development of air power from balloons and dirigibles through employment in World War I and II. Chronological approach to growth of air power in response to civil and military requirements. Sophomore year course for AFROTC cadets. Open to all university students.

ARSC 201 The Development of Air Power II (1) One class and one laboratory per week. Growth and development of air power and aerospace support forces from 1945 in response to Korea, the Cold War, Southeast Asia, and the Space Age. The peaceful employment of aerospace forces for relief and civic action program. Sophomore year course for AFROTC cadets. Open to all university students.

ARSC 205 The U.S. Air Force and Air Power (4) Six week field training session held during summer months at designated Air Force bases. Open only to applicants selected by AFROTC to compete for entrance into the two year AFROTC program as a contract cadet. Successful completion is a pre-requisite for acceptance into the two year AFROTC program. Course content consists of a combination of academics, physical training and leadership laboratory experiences approximating those four year cadets gain in ARSC 100/101 and ARSC 200/201.

ARSC 310 Management and Leadership I (3) Study of management functions, techniques and skills, emphasis on application of same in laboratory environment structured to approximate a contemporary military or bureaucratic organization. Junior year course for AFROTC cadets. Open to all University students.

ARSC 311 Management and Leadership II (3) Continuation in study and application of management and leadership skills to a contemporary military environment. Emphasis on leadership, the uniform code of military justice and current issues for the military manager and leader. Junior year course for AFROTC cadets. Open to all University students.

ARSC 320 National Security Forces in Contemporary American Society I (3) The role of the military profession in contemporary American society, its responsibilities to society and its impact on society. The definition, development and alteration of defense policy in supporting national objectives. Senior year course for AFROTC cadets. Open to all University students.

ARSC 321 National Security Forces in Contemporary American Society II (3) A continuation of the study on the formulation, development and alteration of strategy and of the factors in the modern world which necessitate the continuous reassessment of American defense

policy. Investigation of the interplay of various governmental agencies in the formulation of American defense policy. Senior year AFROTC course. Open to all University students.

ARTE — Art Education

ARTE 100 Fundamentals of Art Education (3) Two hours of laboratory and two hours of lecture per week. Fundamental principles of the visual arts for teaching on the elementary level. Elements and principles of design and theory of color. Studio practice in different media.

ARTH — Art History

ARTH 100 Introduction to Art (3) Basic tools of understanding visual art. This course stresses major approaches such as techniques, subject matter, form, and evaluation. Architecture, sculpture, painting, and graphic arts will be discussed. Required of all art majors in the first year.

ARTH 260 History of Art (3) A survey of western art as expressed through architecture, sculpture and painting. Prehistoric times to Renaissance.

ARTH 261 History of Art (3) A survey of western art as expressed through architecture, sculpture and painting from Renaissance to the present.

ARTH 262 Arts of Asia (3) The history of South and East Asian art from prehistory through the mid 19th century.

ARTH 284 Introduction to African Art (3) General concepts preparing the student for a better understanding of African cultures through an appreciation of their art.

ARTH 320 Masterpieces of Painting (3) A study of the contributions of a few major painters, ranging from Giotto to Titian.

ARTH 321 Masterpieces of Painting (3) A study of the contributions of a few major painters, ranging from El Greco to Picasso.

ARTH 330 Masterpieces of Sculpture (3) A study of the contributions of a few major sculptors, ranging from Polykleitos to Ghiberti.

ARTH 331 Masterpieces of Sculpture (3) A study of the contributions of a few major sculptors, ranging from Ghiberti to Moore.

ARTH 338 Special Topics in Music and Art (3) Variable topics as announced. Repeatable to a maximum of six credits. (Listed also as MUSC 338.)

ARTH 340 Masterpieces of Architecture (3) A study of great architecture from Stonehenge to the cathedral at Pisa.

ARTH 341 Masterpieces of Architecture (3) A study of great architecture from Abbaye-Aux-Hommes to Dulles Airport.

ARTH 401 Greek and Roman Painting (3) Survey of Greek and Roman frescoes and panels, study of extant paintings and lost works known only through literary sources.

ARTH 402 Greek Art and Archaeology (3) Greek art and archaeology from 1000 B.C. To 50 B.C.

ARTH 403 Roman Art and Archaeology (3) Roman art and archaeology from Etruscan origins to Diocletian.

ARTH 404 Bronze Age Art (3) Art of the Near East, Egypt and Aegean.

ARTH 405 Japanese Painting (3) Survey of Japanese painting from the sixth through the sixteenth centuries, including traditional Buddhist painting, narrative scrolls, and Zen-related ink painting.

ARTH 406 Arts of China (3) Chinese art from pre-history through the 14th century, with special focus on painting, sculpture, and minor arts.

ARTH 407 Arts of Japan (3) A survey of Japanese art from pre-history through 14th century, concentrating on architecture, sculpture and painting.

ARTH 410 Early Christian - Early Byzantine Art (3) Sculpture, painting, architecture, and the minor arts from about 312 TO 726 A.D.

ARTH 411 Byzantine Art, 726 - 1453 (3) Sculpture, painting, architecture and the minor arts from 726 to 1453 A.D.

ARTH 412 Medieval Art (3) Architecture, sculpture and painting in the Middle Ages. First semester will stress Romanesque.

ARTH 413 Medieval Art (3) Architecture, sculpture and painting in the Middle Ages. Second semester will stress the Gothic period.

ARTH 416 Northern European Painting in the 15th Century (3) Painting in the Netherlands, France and Germany.

ARTH 417 Northern European Painting in the 16th Century (3) Painting in the Netherlands, France and Germany.

ARTH 422 Early Renaissance Art in Italy (3) Architecture, sculpture and painting from about 1400 to 1430.

ARTH 423 Early Renaissance Art in Italy (3) Architecture, sculpture and painting from about 1430 to 1475.

ARTH 424 High Renaissance Art in Italy (3) Architecture, sculpture and painting from about 1475 to 1500.

ARTH 425 High Renaissance Art in Italy (3) Architecture, sculpture and painting from about 1500 to 1525.

ARTH 430 European Baroque Art (3) Architecture, sculpture and painting of the major southern European centers in the 17th century.

ARTH 431 European Baroque Art (3) Architecture, sculpture and painting of the major northern European centers in the 17th century.

ARTH 434 French Painting (3) French painting from 1400 to 1600. From Fouquet to Poussin.

ARTH 435 French Painting (3) French painting from 1600 to 1800. From Le Brun to David.

ARTH 440 19th Century European Art (3) Architecture, sculpture and painting in Europe from Neo-Classicism to Romanticism.

ARTH 441 19th Century European Art (3) Architecture, sculpture and painting in Europe. From Realism, to Impressionism and Symbolism.

ARTH 445 Impressionism and Neo-Impressionism (3) Prerequisite: ARTH 260, 261 or consent of instructor. History of Impressionism and Neo-Impressionism artists, styles, art theories, criticism, sources and influence on 20th century.

ARTH 450 20th Century Art (3) Painting, sculpture and architecture from the late 19th century to 1920.

ARTH 451 20th Century Art (3) Painting, sculpture and architecture from 1920 to the present.

ARTH 452 History of Photography (3) History of photography as art from 1839 to the present.

ARTH 454 Nineteenth and Twentieth Century Sculpture (3) Trends in sculpture from Neo-Classicism to the present. Emphasis will be put on the redefinition of sculpture during the 20th century.

ARTH 460 History of the Graphic Arts (3) Prerequisite: ARTH 100, or ARTH 260 and 261, or consent of instructor. Graphic techniques and styles in Europe from 1400 to 1800, contributions of major artists.

ARTH 462 African Art (3) First semester, the cultures west of the Niger river (Nigeria through Mali) FROM 400 B.C. To the present. The art is studied through its iconography and function in the culture and the intercultural influences upon the artists, including a study of the societies, cults and ceremonies during which the art was used.

ARTH 463 African Art (3) Second semester, the cultures east and south of Nigeria. The art is studied through its iconography and function in the culture and the intercultural influences upon the artists, including a study of the societies, cults and ceremonies during which the art was used.

ARTH 464 African Art Research (3) Seminar with concentration on particular aspects of African art. The course is given at the Museum of African Art in Washington, D.C.

ARTH 470 Latin American Art (3) Art of the Pre-Hispanic and the Colonial periods.

ARTH 471 Latin American Art (3) Art of the 19th and 20th centuries.

ARTH 473 Arts of Black Americans I (3) The visual arts of Black Americans from the Colonial period through the 19th century, including crafts and decorative arts.

ARTH 474 Arts of Black Americans II (3) The visual arts of Black Americans in the 20th century, including crafts and decorative arts.

ARTH 476 History of American Art to 1900 (3) Architecture, sculpture and painting in the United States from the Colonial period to 1900.

ARTH 477 History of American Art Since 1900 (3) Architecture, sculpture and painting in the United States from 1900 to the present.

ARTH 489 Special Topics in Art History (3) Prerequisite: consent of department head or instructor. May be repeated to a maximum of six credits.

ARTH 498 Directed Studies in Art History I (2-3) For advanced students, by permission of department chairman. Course may be repeated for credit if content differs.

ARTH 499 Directed Studies in Art History II (2-3)

ARTS — Art Studio

ARTS 100 Elements of Design (3) Two lecture hours and two laboratory hours per week. Principles and elements of design through manipulation and organization of materials in two and three dimensions.

ARTS 110 Elements of Drawing (3) Six hours per week. An introductory course with a variety of media and related techniques. Problems based on still life, figure and nature.

ARTS 200 Intermediate Design (3) Six hours per week. Prerequisites ARTS 100, 110. A continuation of Design I with more individually structured problems in terms of form, composition and meaning.

ARTS 208 Design (3) Six hours per week. Prerequisites: ARTS 100, ARTS 110. A continuation of ARTS 100 with more individually structured problems in terms of form, composition, and meaning. Course may be repeated for total of six credits if content differs.

ARTS 210 Intermediate Drawing (3) Six hours per week. Prerequisites: ARTS 100 AND 110. Emphasis on understanding organic form, as related to study from the human figure and to pictorial composition.

ARTS 215 Anatomical Drawing (3) Six hours per week. Prerequisites: ARTS 210 or permission of instrucotr. A drawing course based on the study of anatomical structure emphasizing the human body.

ARTS 277 Architectural Presentation (3) Six hours per week. Prerequisites: ARTS 100, 110. Techniques of wash and watercolor in architectural, interior and landscape architectural rendering.

ARTS 320 Elements of Painting (3) Six studio hours per week. Prerequisite: ARTS 210. Basic tools and language of painting. Oil and/or water-based paints.

ARTS 330 Elements of Sculpture: Modeling/casting (3) Six studio hours per week. Prerequisite: ARTS 210. Basic techniques and processes related to the modeling of clay and related material and the casting of these materials in bronze.

ARTS 334 Elements of Sculpture: Construction (3) Six studio hours per week. Prerequisite: ARTS 210. Basic techniques and processes related to metals, plastics, fiberglass, and wood construction.

ARTS 335 Elements of Sculpture: Carving (3) Six studio hours per week. Prerequisite: ARTS 210. Basic techniques and processes related to carving in stone and wood. Direct experience in handling volume, mass, movement and structure.

ARTS 340 Elements of Printmaking: Intaglio (3) Six hours per week. Prerequisite: ARTS 210. Basic techniques and processes related to etching, aquatint, and drypoint.

ARTS 341 Elements of Printmaking: Woodcut and Relief (3) Six studio hours per week. Prerequisite: ARTS 210. Basic techniques and processes related to woodcuts, linocuts, and other relief media.

ARTS 342 Elements of Printmaking: Collagraphy (3) Six studio hours per week. Prerequisite: ARTS 210.

Basic techniques and processes related to collagraph printing.

ARTS 343 Elements of Printmaking: Screen Printing (3) Six studio hours per week Prerequisite ARTS 210. Basic techniques and processes related to serigraph and silkscreen printing.

ARTS 344 Elements of Printmaking: Lithography (3) Six studio hours per week Prerequisite. ARTS 210. Basic techniques and processes related to drawing, preparing and printing images on lithograph stones or plates.

ARTS 404 Experiments in Visual Processes (3) Six hours per week Prerequisites: either ARTS 220, 330 OR 340 Investigation and execution of process oriented art. Group and individual experimental projects.

ARTS 418 Drawing (3) Six hours per week. Prerequisite: ARTS 210. Original compositions from the figure and nature, supplemented by problems of personal and expressive drawing. Repeatable for total of 12 credits.

ARTS 428 Painting (3) Six studio hours per week. Prerequisite: ARTS 320. Original compositions based upon nature, figure, still life and expressive painting emphasizing development of personal directions. Repeatable to a maximum of twelve credits.

ARTS 438 Sculpture (3) Six studio hours per week. Prerequisite: One 300 level sculpture course and consent of instructor. Continuation of 300 level elements of sculpture courses with emphasis on developing personal directions in chosen media. Repeatable to a maximum of twelve credits.

ARTS 448 Printmaking (3) Six studio hours per week. Prerequisites. One 300 level printmaking course and consent of instructor. Continuation of 300 level elements of printmaking courses with emphasis on developing personal directions in chosen media. Repeatable to a maximum of twelve credits.

ARTS 468 Advanced Seminar in Studio Art (3) Three studio, three discussion hours per week Prerequisite: permission of instructor. Relationship of student's work to historical and contemporary context. Repeatable to a maximum of six credits.

ARTS 489 Special Problems in Studio Arts (3) Prerequisite: consent of instructor. Repeatable to a maximum of six hours.

ARTS 498 Directed Studies in Studio Art (2-3) For advanced students, by permission of department chairman. Course may be repeated for credit if content differs.

ASTR — Astronomy

ASTR 100 Introduction to Astronomy (3) An elementary course in descriptive astronomy, especially appropriate for non-science students. Sun, moon, planets, stars and nebulae, galaxies, evolution. Credit for ASTR 100 cannot be obtained after, or simultaneously with, receiving credit for any astronomy course numbered 150 or higher.

ASTR 110 Astronomy Laboratory (1) Two hours of laboratory work per week Prerequisite previous or concurrent enrollment in ASTR 100. Exercises include use of photographs of moon, stars, nebulae and galaxies and spectra, experiments demonstrating scientific concepts used in astronomy Daytime and nighttime observations if weather permits. Appropriate for non-science majors.

ASTR 111 Observational Astronomy Laboratory (1) Corequisite ASTR 100. Two hours of laboratory per week Single evening laboratory projects plus semester-long observing projects involving work both in and out of class. Lunar surface features, the night-time sky, changing positions of sun, moon, and planets; stellar spectra, observation of stars and nebulae in our galaxy.

ASTR 181 Introductory Astronomy and Astrophysics I (3) Corequisite - MATH 140. Three lectures per week. For science and mathematics majors Survey of several branches of astronomy such as the solar system, properties of stars and stellar systems, and the galaxy ASTR 181 should not normally be taken by students who have already taken ASTR 100 and 105.

ASTR 182 Introductory Astronomy and Astrophysics II (3) Prerequisites - ASTR 181 or consent of the instructor Three lectures per week For science and mathematics majors Aspects of astronomy not included in ASTR 181 and in general more oriented toward astrophysics. The sun, stellar evolution, extragalactic objects and cosmology Credit will be given only one course ASTR 182 or 350.

ASTR 210 Practical Astronomy (2-3) Prerequisites: ASTR 181 or 350 and MATH 140 ASTR 100 and 105 may be substituted for ASTR 181 if approved by instructor. One lecture and one two-hour laboratory per week 2-3 Credits, according to work done. Designed primarily for astronomy majors to give the student familiarity with techniques used by astronomers and an understanding of how astronomical data are obtained. Students registered for 2 credits will not be required to do all the exercises. Coordinate systems, optics, photometry, binary stars, distance determination, Hertzsprung-Russel diagram, solar observations, moon, galactic structure, and galaxies.

ASTR 288 Special Projects in Astronomy (1-3) Prerequisite: permission of the instructor. Independent study, short research projects, tutorial reading, and assisting with faculty research and teaching under special supervision. Repeatable to a maximum of six credits.

ASTR 300 Stars and Stellar Systems (3) Prerequisite: ASTR 100 and completion of University Studies requirement in the natural sciences or consent of instructor. Designed primarily for non-physical-science majors. Study of stars-types, properties, evolution, and distribution in space; supernovae, pulsars, and black holes.

ASTR 315 Navigation (3) Prerequisite: plane trigonometry. Theory and practice of navigation without landmarks, with emphasis on celestial navigation and some discussion of electronic navigation. Spherical trigonometry as necessary. Extensive practical work at times to be arranged.

ASTR 330 Solar-System Astronomy (3) Prerequisite: ASTR 100 and completion of University Studies requirement in the natural science, or consent of instructor. Designed primarily for non-physical-science majors. The structure of planets and of their atmospheres, the nature of comets, asteriods, and satellites. Comparison of various theories for the origin of the solar system. Emphasis on a description of recent data and interpretation.

ASTR 340 Galaxies and the Universe (3) Prerequisite: ASTR 100 and completion of University Studies requirement in the natural science or consent of instructor. Designed primarily for non-physical science majors. A study of galaxies including our own galaxy, radio galaxies, and quasars. Measurement of distances, recession of galaxies, the microwave background and its relation to cosmology.

ASTR 350 Astronomy and Astrophysics (4) Prerequisites: PHYS 192, 262 or 142, or the consent of the instructor. Recommended corequisite - PHYS 293 or 263 Survey course in astronomy and astrophysics, with strong emphasis on physical concepts. No previous astronomy assumed. Credit will be given only for one course, ASTR 182 or 350.

ASTR 380 Life in the Universe (3) Prerequisite: ASTR 100 and completion of University Studies requirement in the natural science, or consent of instructor Designed primarily for non-physical science majors. Study of the astronomical perspective on the conditions for the origin and existence of life. Communication with extraterrestrial life.

ASTR 398 Special Topics in Astronomy (3) Prerequisite junior standing or consent of instructor. This course is designed primarily for students not majoring in astronomy and is suitable for nonscience students. It will concentrate study in some limited field in astronomy which will vary from semester to semester. Possible subjects for study are the solar system, extragalactic astronomy and cosmology, the inconstant universe. Repeatable to a maximum of six credits

ASTR 399 Honors Seminar (1-16) Credit according to work done Enrollment is limited to students admitted to the honors program in astronomy.

ASTR 400 Stellar Astrophysics (3) Pre- or corequisite PHYS 420 or PHYS 421 or consent of instructor Stellar atmospheres, stellar structure and evolution, neutron stars and black holes

ASTR 401 Interstellar and Extragalactic Astrophysics (3) Pre- or corequisite PHYS 422 or consent of instructor A survey of the physics of the interstellar medium and of astrophysics as it relates to galaxies and cosmology.

ASTR 410 Observational Astronomy I (3) Prerequisites: PHYS 294 or 263, and 3 credits in astronomy An introduction to current methods of obtaining astronomical information. Emphasis on optical and radio techniques, with brief coverage of X-ray, ultraviolet, and infrared techniques. Emphasis on understanding how instruments affect the data.

ASTR 411 Observational Astronomy II (3) Prerequisite: ASTR 410 Laboratory work with photographic and photoelectric techniques and with components of radio telescopes. Two longer individual projects involving observations with various instruments. Often requires all-night observing sessions.

ASTR 420 Introduction to Galactic Research (3) Prerequisite: PHYS 192 and ASTR 182 or equivalent, or consent of instructor. Methods of galactic research, stellar motions, clusters of stars, evolution of the galaxy, study of our own and nearby galaxies.

ASTR 430 The Solar System (3) Prerequisite - MATH 246 and either PHYS 263 or PHYS 294, or consent of instructor. The structure of planetary atmospheres, radiative transfer in planetary atmospheres, remote sensing of planetary surfaces, interior structure of planets. Structure of comets. Brief discussions of asteroids, satellite systems, and solar system evolution.

ASTR 440 Introduction to Extra-Galactic Astronomy (3) Prerequisite. PHYS 192 and ASTR 182 or equivalent, or consent of instructor. Properties of normal and peculiar galaxies, including radio galaxies and quasars; expansion of the universe and cosmology

ASTR 450 Celestial Mechanics (3) Three lectures a week Prerequisite. PHYS 410 or consent of instructor. Celestial mechanics, orbit theory, equations of motion.

ASTR 498 Special Problems in Astronomy (1-6) Prerequisite: major in physics or astronomy and/or consent of advisor Research or special study. Credit according to work done.

BCHM — Biochemistry

BCHM 261 Elements of Biochemistry (3) Prerequisite: CHEM 104 or 233 or 235 For undergraduate students who desire a one-semester biochemistry course rather than a two-semester sequence. Basic chemistry and metabolism of most molecules of biological importance. Not open to students with credit in BCHM 461.

BCHM 461 Biochemistry I (3) Prerequisites: CHEM 243 or 245, or permission of instructor. A comprehensive introduction to general biochemistry The chemistry and metabolism of carbohydrates, lipids, nucleic acids, and proteins.

BCHM 462 Biochemistry II (3) Prerequisite: BCHM 461. A continuation of BCHM 461

BCHM 463 Biochemistry Laboratory I (2) Two three-hour laboratory periods per week. Pre or corerequisite: BCHM 461.

BCHM 464 Biochemistry Laboratory II (2) Two three-hour laboratory periods per week Prerequisite: CHEM 483 or BCHM 463, pre or corequisite BCHM 462.

BIOL — Biology

BIOL 101 Concepts of Biology (3) An introductory lecture course for the non-science major emphasizing the fundamental processes and interdependence of living organisms and the biological implications associated with human influence in the biological world This course will not count toward graduation requirements for any student in the Division of Agricultural and Life Sciences

BIOL 102 Laboratory in Biology (1) One three-hour laboratory per week Pre- or corequisite BIOL 101 A course designed for non-science students to illustrate the concepts underlying the organization and interrelationships of living organisms This course will not count toward graduation requirements for any student in the Division of Agricultural and Life Sciences

BIOL 124 Cosmic Evolution (3) Three lecturre per week Prerequisites High school chemistry and biology Especially appropriate for non-science students. The

current scientific thinking on the sequence of events from the origin of the universe to the appearance of man. Emphasis on chemical and biological evolution.

BIOL 398 Honors Research Problems in Biology (1-3) Prerequisite: Participation in the General Honors Program and/or the General Biological Sciences Honors Program. Research in biology under the direction and close supervision of a member of the faculty. May be repeated to a maximum of six credits.

BIOL 399 Honors Seminar in Biology (1) Prerequisite: Participation in the General Honors Program and/or the General Biological Sciences Honors Program, and previous or concurrent enrollment in BIOL 398. Discussion and presentation of special topics, current literature, problems and progress in all areas of biological research. Repeatable to a maximum of two semester hours credit.

BIOM — Biometrics

BIOM 301 Introduction to Biometrics (3) Two lectures and one discussion period per week. Prerequisite: Completion of division math requirement. Descriptive statistics, introduction to probability, sampling, confidence interval estimation, hypothesis testing, simple regression and correlation. Emphasis on simple applications of statistical techniques and interpretation of statistical results.

BIOM 401 Biostatistics I (4) Three lectures and one discussion per week. Prerequisite: MATH 115, BIOM 301, or permission of the instructor. Descriptive statistics, probability models useful in biology, expectations, hypothesis testing, sign test, goodness of fit tests, central limit theorem, point and interval estimates, analysis of variance, regression, correlation, sampling, rank tests. Emphasis on the uses and the limitations of these methods in biology.

BIOM 405 Computer Applications in Biometrics (1) One, 2-hour laboratory per week. Prerequisite: BIOM 401 or equivalent. An introduction to computer usage in statistical analyses. Topics include file manipulation, formating data, transformations, descriptive statistics, graphical displays of data, and several introductory inferential statistical procedures.

BIOM 420 Sampling Techniques in Biometrics (3) Prerequisite: BIOM 401 or permission of the instructor. Methods of sampling: probability, random, cluster, stratified, inverse; ratio estimates; methods in field surveys: mark recapture studies, line transect sampling; surveys, design of collection forms; sample size calculations. Emphasis on the use of these methods in biological research.

BMGT — Business and Management

BMGT 110 Introduction to Business and Management (3) A survey of the field of business, including its environment, organization, overall and functional management, and current issues and developments.

BMGT 220 Principles of Accounting I (3) Prerequisite: Sophomore standing. Study of the basic principles of accounting for business enterprises.

BMGT 221 Principles of Accounting II (3) Prerequisite: BMGT 220. Continuation of BMGT 220.

BMGT 230 Business Statistics (3) Prerequisite: MATH 220 or consent of instructor. Introductory course in probabilistic and statistical concepts including descriptive statistics, set-theoretic development of probability, the properties of discrete and continuous random variables, sampling theory, estimation, hypothesis testing, regression, anlaysis of variance, categorical data analysis, and the application of these concepts to problem solving in business and management. This course may not be taken for credit by management science and statistics majors. Only one of the following courses may be taken for credit: BMGT 230, 231; SOCY 201; PSYC 200; GEOG 305, ECON 421; or EDMS 451.

BMGT 231 Statistical Models For Business (3) Prerequisite: MATH 141 or consent of instructor. For management science and statistics majors. An introductory course in statistical concepts including probability from a naive set theory approach, random variables and their properties, and the probability distributions of selected discrete and continuous random variables. The concepts of sampling, sampling distributions, and the application of these concepts to estimation hypothesis testing are included as are brief surveys of the regression and anova models. Only one of the following courses may be taken for credit: BMGT 230, 231; SOCY 201; PSYC 200; GEOG 305; ECON 421, or EDMS 451.

BMGT 301 Introduction to Data Processing (3) The fundamentals of business data processing. Organizational, environmental and managerial aspects of computer systems. Heavy emphasis on COBOL language. Limited coverage of other business computing languages including the report generator (RPG) language. Several programming projects assigned.

BMGT 302 Information Systems Implementation Techniques (3) Prerequisite: BMGT 301. Advanced concepts and tools necessary for the construction of computer based information systems. Operating systems, data and storage structures, file processing and advanced features of the COBOL language. Techniques related to the overall development of software projects including project management, software design, engineering and software documentation. Several programming projects assigned.

BMGT 310 Intermediate Accounting I (3) Prerequisite: BMGT 221. Comprehensive analysis of financial accounting topics related to financial statement preparation and external reporting.

BMGT 311 Intermediate Accounting II (3) Prerequisite: BMGT 310. Continuation of BMGT 310.

BMGT 321 Cost Accounting (3) Prerequisite: BMGT 221. A study of the basic concepts of product costing and cost analysis for management planning and control. Emphasis is placed on the role of the accountant in organizational management, analysis of cost behavior, standard cost, budgeting, responsibility accounting and relevant costs for decision making.

BMGT 323 Income Tax Accounting (3) Prerequisite: BMGT 221. Introduction to federal income taxation of individuals. Examination of tax laws by use of illustrative examples and problems.

BMGT 326 Accounting Systems (3) Prerequisites: BMGT 221, BMGT 301, and BMGT 321. A study of the control aspects of accounting systems. Topics include: standard setting, administrative, operational, and security controls; cost effectiveness of systems; audit implications of a computer-based information environment. Not open to students with credit in BMGT 320.

BMGT 332 Operations Research For Management Decisions (3) Prerequisite: MATH 220, BMGT 230. Surveys the philosophy, techniques, and applications of operations research to managerial decision making. The course is designed primarily for students not majoring in management science or statistics. Techniques covered include linear programming, transportation and assignment models, Markov processes, inventory and queueing models. Emphasis is placed on formulating and solving decision problems in the functional areas of management.

BMGT 340 Business Finance (3) Prerequisites: BMGT 221 and 230. The principles and practices involved in the organization, financing, and rehabilitation of business enterprises; the various types of securities and their use in raising funds, apportioning income, risk, and control; intercorporate relations; and new developments. Emphasis on solution of problems of financial policy faced by management.

BMGT 343 Investments (3) Prerequisite: BMGT 340. An introduction to financial investments. Topics include securities and securities markets, investment risks, returns, and constraints, portfolio policies; and institutional investment policies.

BMGT 345 Property and Liability Insurance (3) Prerequisites: BMGT 221 and 230. Analysis of the major areas of property and casualty covers, including fire, indirect loss, crime, automobile, ocean and inland marine, and liability. Investigation of substandard, residual, and reinsurance markets and discussion of current issues.

BMGT 346 Risk Management (3) Prerequisites: BMGT 221 and 230. Recognition and evaluation of the pure risks facing organizations. Guides for risk management decisions concerning the retention, control, and transfer (including insurance) of risk.

BMGT 347 Life Insurance (3) Prerequisite: BMGT 221. Life and health insurance products and principles in business financial planning. Pension planning including deferred compensation and profit sharing plans, use of trust in business and individual estate planning; comprehensive analysis of the impact of income, estate, and gift taxation on life insurance programming and estate planning.

BMGT 350 Marketing Principles and Organization (3) Prerequisite: ECON 203 or 205. This is an introductory course in the field of marketing. Its purpose is to give a general understanding and appreciation of the forces operating institutions employed, and methods followed in marketing agricultural products, natural products, services and manufactured goods.

BMGT 353 Retail Management (3) Prerequisites: BMGT 220 and 350. Retail store organization, location, layout and store policy; pricing policies, price lines, brands, credit policies, records as a guide to buying; purchasing methods, supervision of selling; training and supervision of retail sales force; and administrative problems.

BMGT 354 Promotion Management (3) Prerequisite: BMGT 350. The use of advertising, personal selling, sales promotions, and other methods in marketing programs. Case studies in the use and coordination of demand stimulation methods, analysis and planning. Research, testing and statistical control of promotional activities. (Not open for credit to students with credit for BMGT 452.)

BMGT 360 Personnel Management (3) The basic course in personnel management includes manpower planning, recruitment, selection, development, compensation, and appraisal of employees. Explores the impact of scientific management and unionism on these functions.

BMGT 362 Labor Relations (3) A study of the development and methods of organized groups in industry with reference to the settlement of labor disputes. An economic and legal analysis of labor union and employer association activities, arbitration, mediation, and conciliation; collective bargaining, trade agreements, strikes, boycotts, lockouts, company unions, employee representation, and injunctions.

BMGT 364 Management and Organization Theory (3) The development of management and organization theory, nature of the management process and function and its future development. The role of the manager as an organizer and director, the communication process, goals and responsibilites.

BMGT 370 Principles of Transportation (3) Prerequisite: ECON 203 or 205. A general course covering the five fields of transportation, their development, service, and regulation.

BMGT 372 Traffic and Physical Distribution Management (3) Prerequisite: Junior standing. Examines the management aspects of the business firm in moving their raw materials and finished goods through traffic, warehousing, industrial packaging, materials handling, and inventory. A systematic examination of the trade-off possibilities and management alternatives to minimize cost of product flow and maximizing customer service is provided. (Not open to students with credit for BMGT 371.)

BMGT 380 Business Law I (3) Legal aspects of business relationships. Examination of torts and business crimes, contracts and agency. The law of personal property and bailment relationships. Survey of public policy issues.

BMGT 381 Business Law II (3) Prerequisite: BMGT 380 or permission of instructor. The Uniform Commercial Code including sales, commercial paper, secured transactions, bulk sales and documents of title. The law of partnerships and corporations. Reorganization and liquidation under the bankruptcy laws. The law of real property, landlord and tenant relationships and decedents' estates.

BMGT 385 Production Management (3) Studies the operation of a manufacturing enterprise, concentrating on the economies of production. Introduces a grounding in analytical method early so that the broad problem areas of system design, operation and control can be based upon the analytical method.

BMGT 392 Introduction to International Business Management (3) Prerequisite: ECON 203 or 205. A study of the domestic and foreign environmental factors affecting the international operations of U.S. business firms. The course also covers the administrative aspects of international marketing, finance and management.

BMGT 393 Real Estate Principles (3) Prerequisite: ECON 203 or 205. This course covers the nature and uses of real estate, real estate as a business, basic principles, construction problems and home ownership, city planning, and public control and ownership of real estate.

BMGT 398 Individual Study in Business and Management (1-3) Prerequisite: permission of instructor. Repeatable to a maximum of six credits.

BMGT 402 Database and Data Communication Systems (3) Prerequisite: BMGT 302. Introduction to database and data communications systems. Modeling and database construction using the three data models - network, relational and hierarchical. Implementation project using DMS 1100 database system. Data communications protocols and communications support software. Analysis of distributed systems and computer networks. Emphasis on new technologies.

BMGT 403 Systems Analysis (3) Prerequisite: BMGT 402. Techniques and tools applicable to the analysis and design of computer based information systems. System life cycle, requirements analysis, logical design of data bases, performance evaluation. Emphasis on case studies. Project required that involves the design, analysis and implementation of an information system.

BMGT 404 Seminar in Decision Support Systems (3) Prerequisite: BMGT 301. Design of computer systems to solve business problems and to support decision making. Human and organizational factors are considered. Emphasis on case studies.

BMGT 410 Fund Accounting (3) Prerequisite: BMGT 310. An introduction to the fund-based theory and practice of accounting as applied to governmental entities and not-for-profit associations.

BMGT 417 Advanced Tax Accounting (3) Prerequisites - BMGT 311 and 323. Federal taxation of corporations, partnerships, fiduciaries, and gratuitous transfers. Tools and techniques of tax research for compliance and planning.

BMGT 420 Undergraduate Accounting Seminar (3) Prerequisite: senior standing as an accounting major or consent of instructor. Enrollment limited to upper one-third of senior class. Seminar coverage of outstanding current non-text literature, current problems and case studies in accounting.

BMGT 421 Undergraduate Accounting Seminar (3) Prerequisite: Senior standing as an accounting major or consent of instructor. Enrollment limited to upper one-third of senior class. Seminar coverage of outstanding current non-text literature, current problems and case studies in accounting.

BMGT 422 Auditing Theory and Practice (3) Prerequisite: BMGT 311. A study of the independent accountant's attest function, generally accepted auditing standards, compliance and substantive tests, and report forms and opinions.

BMGT 424 Advanced Accounting (3) Prerequisite: BMGT 311. Advanced accounting theory applied to specialized topics and current problems. Emphasis on consolidated statements and partnership accounting.

BMGT 426 Advanced Cost Accounting (3) Prerequisite: BMGT 321. Advanced cost accounting with emphasis on managerial aspects of internal record-keeping and control systems.

BMGT 427 Advanced Auditing Theory and Practice (3) Prerequisite: BMGT 422. An examination and in depth study of special auditing topics such as statistical sampling, professional ethics, EDP auditing, legal liability, and SEC accounting.

BMGT 430 Linear Statistical Models in Business (3) Prerequisite: BMGT 230 or consent of instructor. Model building involving an intensive study of the general linear stochastic model and the applications of this model to business problems. The model is derived in matrix form and this form is used to analyze both the regression and anova formulations of the general linear model.

BMGT 431 Design of Statistical Experiments in Business (3) Prerequisite: BMGT 230 OR 231. Surveys ANOVA models, basic and advanced experimental design concepts. Non-parametric tests and correlation are emphasized. Applications of these techniques to business problems in primarily the marketing and behavioral sciences are stressed.

BMGT 432 Sample Survey Design For Business and Economics (3) Prerequisite: BMGT 230 OR 231. Design of probability samples. Simple random sampling, stratified random sampling, systematic sampling, and cluster sampling designs are developed and compared for efficiency under varying assumptions about the population sampled. Advanced designs such as multistage cluster sampling and replicated sampling are surveyed. Implementing these techniques in estimating parameters of business models is stressed.

BMGT 433 Statistical Decision Theory in Business (3) Prerequisite: BMGT 231 or consent of instructor. Bayesian approach to the use of sample information in decision-making. Concepts of loss, risk, decision criteria, expected returns, and expected utility are examined. Application of these concepts to decision-making in the firm in various contexts are considered.

BMGT 434 Introduction to Optimization Theory (3) Prerequisite: MATH 220 or permission of instructor. Primarily for students majoring in management science and statistics. Linear programming, postoptimality analysis, network algorithms, dynamic programming, nonlinear programming and single variable minimization.

BMGT 435 Introduction to Applied Probability Models (3) Prerequisite: MATH 220 and BMGT 231 or permission of the instructor. Stochastic models in management. Stochastic Markov processes, probabalistic inventory models, queueing theory, simulation, reliability theory and dynamic programming.

BMGT 436 Applications of Mathematical Programming in Management Science (3) Prerequisite: BMGT 434 or permission of instructor. Theory and applications of linear, integer, and nonlinear programming models to management decisions. Topics covered include the basic theorems of linear programming, the matrix formulation of the simplex and dual Simplex algorithms; decomposition, cutting plane, branch and bound, and implicit enumeration algorithms; gradient based algorithms, and quadratic programming. Special emphasis is placed upon model formulation and solution using prepared computer algorithms.

BMGT 438 Topics in Statistical Analysis For Business Management (3) Prerequisite: BMGT 430 and MATH 240 or permission of the instructor. Selected topics in statistical analysis which are relevant to management for students with knowledge of basic statistical methods. Topics include evolutionary operation and response surface analysis, forecasting techniques, pathologies of the linear model and their remedies, multivariate statistical models, and non-parametric models.

BMGT 440 Financial Management (3) Prerequisite: BMGT 340. Analysis and discussion of cases and readings relating to financial decisions of the firm. The application of finance concepts to the solution of financial problems is emphasized.

BMGT 443 Security Analysis and Valuation (3) Prerequisite: BMGT 343. Study and application of the concepts, methods, models, and empirical findings to the analysis, valuation, and selection of securities, especially common stock.

BMGT 444 Futures Contracts and Options (3) Prerequisite: BMGT 343. The institutional features and economic rationale underlying markets in futures and options. Hedging, speculation, structure of futures prices, interest rate futures, efficiency in futures markets, and stock and commodity options.

BMGT 445 Commerical Bank Management (3) Prerequisites: BMGT 340 and ECON 430. Analysis and discussion of cases and readings in commercial bank management. The loan function is emphasized also the management of liquidity reserves, investments for income, and source of funds. Bank objectives, functions, policies, organization, structure, services, and regulation are considered.

BMGT 450 Marketing Research Methods (3) Prerequisites: BMGT 230 AND 350. Recommended that BMGT 430 be taken prior to this course. This course is intended to develop skill in the use of scientific methods in the acquisition, analysis and interpretation of marketing data. It covers the specialized fields of marketing research, the planning of survey projects, sample design, tabulation procedure and report preparation.

BMGT 451 Consumer Analysis (3) Prerequisite: BMGT 350. Recommended that PSYC 100 and 221 be taken prior to this course. Considers the growing importance of the American consumer in the marketing system and the need to understand him. Topics include the foundation considerations underlying consumer behavior such as economic, social, psychological and cultural factors. Analysis of the consumer in marketing situations-as a buyer and user of products and services-and in relation to the various individual social and marketing factors affecting his behavior. The influence of marketing communications is also considered.

BMGT 453 Industrial Marketing (3) Prerequisites: BMGT 350 plus one other marketing course. The industrial and business sector of the marketing system is considered rather than the household or ultimate consumer sector. Industrial products range from raw materials and supplies to the major equipment in a plant, business office, or institution. Topics include product planning and introduction, market analysis and forecasting, channels, pricing, field sales force management, advertising marketing cost analysis, and government relations. Particular attention is given to industrial, business and institutional buying policies and practice and to the analysis of buyer behavior.

BMGT 454 International Marketing (3) Prerequisites: BMGT 350 plus any other marketing course. A study of the marketing functions from the viewpoint of the international executive. In addition to the coverage of international marketing policies relating to product adaptation, data collection and analysis, channels of distribution, pricing, communications, and cost analysis, consideration is given to the cultural, legal, financial, and organizational aspects of international marketing.

BMGT 455 Sales Management (3) Prerequisite: BMGT 350. The role of the sales manager, both at headquarters and in the field, in the management of people, resources and marketing functions. An analysis of the problems involved in sales organization, forecasting, planning, communicating, evaluating and controlling. The application of quantitative techniques and pertinent behavioral science concepts in the management of the sales effort and sales force.

BMGT 456 Advertising (3) Prerequisite: BMGT 354. The role of advertising in the American economy, the impact of advertising on our economic and social life, the methods and techniques currently applied by advertising practitioners, the role of the newspaper, magazine, and other media in the development of an advertising campaign, modern research methods to improve the effectiveness of advertising and the organization of the advertising business. (Not open for credit to students with credit for BMGT 352.)

BMGT 457 Marketing Policies and Strategies (3) Prerequisite: three courses in marketing. Integrative decision making in marketing. Emphasis on consumer and market analysis and the appropriate decision models. Case studies are included.

BMGT 460 Personnel Management: Analysis and Problems (3) Prerequisite: BMGT 360. Recommended, BMGT 230. Research findings, special readings, case analysis, simulation, and field investigations are used to develop a better understanding of personnel problems, alternative solutions and their practical ramifications.

BMGT 462 Labor Legislation (3) Case method analysis of the modern law of industrial relations. Cases include the decisions of administrative agencies, courts and arbitration tribunals.

BMGT 463 Public Sector Labor Relations (3) Prerequisite: BMGT 362 or permission of instructor. Development and structure of labor relations in public sector employment: federal, state, and local government responses to unionization and collective bargaining.

BMGT 464 Organizational Behavior (3) Prerequisite: BMGT 364. An examination of research and theory concerning the forces which contribute to the behavior of organizational members. Topics covered include work group behavior, supervisory behavior, intergroup relations, employee goals and attitudes, communication problems, organizational change, and organizational

goals and design.

BMGT 467 Undergraduate Seminar in Personnel Management (3) Prerequisite: consent of instructor. This course is open only to the top one-third of undergraduate majors in personnel and labor relations and is offered during the fall semester of each year. Highlights major developments. Guest lecturers make periodic presentations.

BMGT 470 Land Transportation Systems (3) Prerequisite: BMGT 370. Overall view of managerial problems facing land carriers, emphasis on rail and motor modes of transportation.

BMGT 471 Air and Water Transportation Systems (3) Prerequisite: BMGT 370. Overall view of managerial problems facing air and water carriers, emphasis on international and domestic aspects of air and water modes of transportation. (Not open for credit to students with credit for BMGT 472.)

BMGT 473 Advanced Transportation Problems (3) Prerequisite: BMGT 370. A critical examination of current government transportation policy and proposed solutions. Urban and intercity managerial transport problems are also considered.

BMGT 474 Urban Transport and Urban Development (3) Prerequisite: ECON 203 or 205. An analysis of the role of urban transportation in present and future urban development. The interaction of transport pricing and service, urban planning, institutional restraints, and public land uses is studied.

BMGT 475 Advanced Logistics Management (3) Prerequisites: BMGT 370, 372, 332. Application of the concepts of BMGT 372 to problem solving and special projects in logistics management, case analysis is stressed.

BMGT 480 Legal Environment of Business (3) The course examines the principal ideas in law stressing those which are relevant for the modern business executive. Legal reasoning as it has evolved in this country will be one of the central topics of study. Several leading antitrust cases will be studied to illustrate vividly the reasoning process as well as the interplay of business, philosophy, and the various conceptions of the nature of law which give direction to the process. Examination of contemporary legal problems and proposed solutions, especially those most likely to affect the business community, are also covered.

BMGT 481 Public Utilities (3) Prerequisite: ECON 203 or 205. Using the regulated industries as specific examples, attention is focused on broad and general problems in such diverse fields as constitutional law, administrative law, public administration, government control of business, advanced economic theory, accounting, valuation and depreciation, taxation, finance, engineering, and management.

BMGT 482 Business and Government (3) Prerequisite: ECON 203 or 205. A study of the role of government in modern economic life. Social control of business as a remedy for the abuses of business enterprise arising from the decline of competition. Criteria of limitations on government regulation of private enterprise.

BMGT 485 Advanced Production Management (3) Prerequisite: BMGT 385. A study of typical problems encountered by the factory manager. The objective is to develop the ability to analyze and solve problems in management control of production and in the formulation of production policies. Among the topics covered are plant location, production planning and control, methods analysis, and time study.

BMGT 490 Urban Land Management (3) Covers the managerial and decision making aspects of urban land and property. Included are such subjects as land use and valuation matters.

BMGT 493 Honors Study (3) First semester of the senior year. Prerequisite: candidacy for honors in business and management. The course is designed for honors students who have elected to conduct intensive study (independent or group). The student will work under the direct guidance of a faculty advisor and the chairman of the honors committee. They shall determine that the area of study is of a scope and intensity deserving of a candidate's attention. Formal written and/or oral reports on the study may be required by the faculty advisor and/or chairman of the honors program. Group meetings of the candidates may be called at the discretion of the faculty advisors and/or chairman of the honors committee.

BMGT 494 Honors Study (3) Second semester of the senior year. Prerequisite: BMGT 493, and continued candidacy for honors in Business and Management. The student shall continue and complete the research initiated in BMGT 493, additional reports may be required at the discretion of the faculty advisor and honors program chairman. Group meetings may be held.

BMGT 495 Business Policies (3) Prerequisites: BMGT 340, 350, 364, and senior standing. A case study course in which the aim is to have the student apply what they have learned of general management principles and their specialized functional applications to the overall management function in the enterprise.

BMGT 496 Business and Society (3) Prerequisite: one course in BMGT or consent of instructor. Normative role of business in society; consideration of the sometimes conflicting interests and claims on the firm and its objectives.

BMGT 498 Special Topics in Business and Management (3) Prerequisite: permission of instructor. Special topics in business and management designed to meet the changing needs and interests of students and faculty. Repeatable to a maximum of six credits if the subject matter is different.

BOTN — Botany

BOTN 100 General Botany For Non-Science Students (4) Two lectures and two laboratory periods a week. A basic course in plant biology specifically designed to meet the educational needs of the general or non-science student. Emphasis is placed on an ecological approach to studying fundamental conepts and processes of plants, and stressing the importance of plant life to human welfare. Credit not allowed for both BOTN 100 AND 101.

BOTN 101 General Botany (4) Three lectures and one three-hour laboratory period a week. A basic course in plant biology specifically designed to meet the educational needs of students majoring in the physical or biological sciences. Fundamental biological principles and mechanisms governing higher plant life in the ecosystem. (Credit not allowed for both BOTN 100 AND 101)

BOTN 102 Honors General Botany (4) A basic course in plant biology designed for honors students and open to others with permission of the instructor. Fundamental biological principles and mechanisms governing plant life.

BOTN 200 Humanistic Botany (2) An introduction to botany for arts and humanities students: nature of botany, form and process in plants, plants in the environment, plants used by humans, plants, history, and culture, plants as art forms, exploring for plants.

BOTN 202 Plant Kingdom (4) Two lectures and two laboratory periods a week. Prerequisite: BOTN 101 or permission of instructor. A brief evolutionary study of algae, fungi, liverworts, mosses, ferns and their relatives, and the seed plants, emphasizing their structure, reproduction, habitats, and economic importance.

BOTN 211 Ecology and Mankind (3) Basic ecological principles as they relate to the ecological dilemmas of overpopulation, pollution, increasing consumption of natural resources, and deteriorating land use ethic facing mankind today. College credit in biological or physical sciences not prerequisite.

BOTN 212 Plant Taxonomy (4) Two lectures and two laboratory periods per week. Prerequisite: BOTN 101 or permission of instructor. An introductory study of plant identification, naming, and classification. Laboratory emphasis on the collection and identification of local vascular plants.

BOTN 221 Introductory Plant Pathology (4) Two lectures and two laboratory periods per week. Prerequisite: BOTN 101 or permission of instructor. An introductory study of the causal agents, nature, and management of plant diseases.

BOTN 315 Economic Botany (3) Two lectures and one laboratory period per week. Prerequisite: BOTN 100 or 101, or permission of the instructor. BOTN 212 is strongly recommended. A survey of the origins and types of plants and plant products utilized by human societies and their historic and economic significance. Emphasis on the origins of specific plants domesticated or used in different civilization centers and cultures.

BOTN 378 Tutorial Readings in Botany (2-3) Open only to honors students in botany. A review of the original literature dealing with a specific research problem in preparation for research to be accomplished in BOTN 379.

BOTN 379 Honors Research Problems in Botany (1-3) Prerequisite: BOTN 378 and twenty credits in botany courses. Open only to honors students in botany. Research in botany under the direction and close supervision of a member of the faculty. May be repeated to a maximum of six credits.

BOTN 398 Seminar (1) Prerequisite: major in botany; with permission of instructor, major in biological science. Discussion and reading on special topics, current literature, or problems and progress in all phases of botany. Repeatable to a maximum of two semester hours credit.

BOTN 399 Research Problems in Botany (1-3) Prerequisites: twenty hours of botany courses and permission of the instructor. Research and/or integrated reading in botany under the direction and close supervision of a member of the faculty. May be repeated for a maximum of 6 credits.

BOTN 401 Origins of Modern Botany (1) Prerequisite: 20 credit hours in biological sciences including BOTN 101 or permission of instructor. History of botany as a science, from ancient Greece through the 18th century; emphasis on botany as an intellectual and cultural pursuit.

BOTN 403 Medicinal and Poisonous Plants (2) Prerequisites: BOTN 101 and CHEM 104. A study of plants important to man that have medicinal or poisonous properties. Emphasis on plant source, plant description, the active agent and its beneficial or detrimental physiological action and effects.

BOTN 405 Advanced Plant Taxonomy (3) Two lectures and one laboratory period per week. Prerequisites: BOTN 202 and BOTN 212, or equivalents. A review of the history and principles of plant taxonomy with emphasis on monographic and floristic research. A detailed laboratory review of the families of flowering plants.

BOTN 407 Teaching Methods in Botany (2) Four two-hour laboratory demonstration periods per week, for eight weeks. Prerequisite: BOTN 101 or permission of instructor. A study of the biological principles of common plants, and demonstrations, projects, and visual aids suitable for teaching in primary and secondary schools.

BOTN 410 Grass Systematics (3) Two lectures and one two-hour laboratory period per week. Prerequisite: BOTN 212 or AGRO 405 or permission of the instructor. A study of the grass family including the structure, classification, identification, and economic importance of members of this diverse family. Grass identification.

BOTN 411 Evolutionary Biology of Plants (3) Prerequisite: BOTN 202 or equivalent. Evolution of basic plant biological systems, major structural adaptations of plant organs, and origins of vascular plant groups. The pace, patterns and mechanisms of evolution, discussed within a genetic, systematic and paleontological framework.

BOTN 412 Vascular Plant Morphology (4) Two lectures and two two-hour laboratory periods per week. Prerequisites: BOTN 202 OR 416, or equivalents. Comparative studies of structural adaptations, reproductive biology, and phylogenetic relationships of bryophytes, fern "allies," ferns, gymnosperms and angiosperms.

BOTN 413 Plant Geography (2) Prerequisite: BOTN 101 or permission of instructor. A study of plant distribution throughout the world and the factors generally associated with such distribution.

BOTN 414 Plant Genetics (3) Prerequisite: BOTN 101 or permission of instructor. The basic principles of plant genetics are presented, the mechanics of transmission of the hereditary factors in relation to the life cycle of seed plants, the genetics of specialized organs and tissues, spontaneous and induced mutations of basic and economic significance gene action, genetic maps, the fundamentals of polyploidy, and genetics in relation to methods of plant breeding are the topics considered.

BOTN 416 Plant Structure (4) Two lectures and two 2-hour laboratory periods per week. Prerequisite: BOTN 101. A survey of the basic structural features of vascular plants, including subcellular organelles, cells, tissues, and organs. Emphasis on structural phenomena as they relate to physiological processes of agricultural importance.

BOTN 417 Field Botany and Taxonomy (2) Four two-hour laboratory periods a week for eight weeks. Prerequisite: BOTN 101 or permission of instructor. The identification of trees, shrubs, and herbs, emphasizing the native plants of Maryland. Manuals, keys, and other techniques will be used. Numerous short field trips will be taken. Each student will make an individual collection.

BOTN 420 Plant Cell Biology (3) Prerequisites: organic chemistry and two years of botany, or permission of the instructor. A study of eucaryotic cell organization, integrating structure with function and concentrating on subcellular organelles and the mechanisms of physiological regulation at the cellular level.

BOTN 423 Diseases of Agronomic Crops and Turf (2) Prerequisite: BOTN 221. Practical experience in recognition and control of diseases affecting field crops such as corn, soybeans, small grains, tobacco and turf. Symptoms of economic importance and control measures for the important diseases of these crops.

BOTN 426 Mycology (4) Two lectures and two three-hour laboratory periods per week. Prerequisite: BOTANY 101 or permission of the instructor. An introductory course in the biology, morphology and taxonomy of the fungi.

BOTN 427 Field Plant Pathology (1) Summer session: lecture and laboratory to be arranged. Prerequisite: BOTN 221, or equivalent. The techniques of pesticide evaluation and the identification and control of diseases of Maryland crops are discussed. Offered in alternate years or more frequently with demand.

BOTN 441 Plant Physiology (4) Two lectures and one four-hour laboratory period per week. Prerequisites: BOTN 101 and general chemistry. Organic chemistry strongly recommended. A survey of the general physiological activities of plants.

BOTN 456 Principles of Microscopy (2) Two lectures and one demonstration per week. Prerequisite: BOTN 420 or its equivalent. An introduction to optical principles that underlie light and electron microscopic image formation. Brightfield, darkfield, phase contrast, differential interference contrast, fluorescence and polarized light microscopy. Comparison of light and electron microscopy. The application of these techniques to problems in biological research.

BOTN 462 Plant Ecology (2) Prerequisite: BOTN 101 or permission of instructor. The dynamics of populations as affected by environmental factors with special emphasis on the structure and composition of natural plant communities, both terrestrial and aquatic.

BOTN 463 Ecology of Marsh and Dune Vegetation (2) Prerequisites: BOTN 101 or permission of instructor. An examination of the biology of higher plants in dune and marsh ecosystems.

BOTN 464 Plant Ecology Laboratory (2) Prerequisite: BOTN 462 or its equivalent or concurrent enrollment therein. One three-hour laboratory period a week. Two or three field trips per semester. The application of field and experimental methods to the qualitative and quantitative study of vegetation and ecosystems.

BOTN 471 Marine and Estuarine Botany (3) Prerequisite: BOTN 441 or equivalent. An ecological discussion of plant life in the marine environment of sea coasts, salt marshes, estuaries and open seas.

BOTN 475 General Phycology (4) One lecture and two three-hour laboratory periods per week. Prerequisites: BOTN 101 and BOTN 202, or permission of instructor. An introductory study of both macro- and micro-algae, including the taxonomy, morphology, and life cycles of both fresh water and marine forms.

BOTN 476 Biology of Phytoplankton (4) Two lectures and two two-hour laboratories per week. Prerequisite: BOTN 101 and an introductory course in ecology (ZOOL 212 or equivalent) or permission of instructor. Collection, identification, culture, physical and chemical requirements, life cycles, community structure, specialized environments, blooms of phytoplankton.

BOTN 484 Plant Biochemistry (3) Prerequisite: BOTN 441 and CHEM 233. 3 lectures per week. Biochemical processes characteristic of plants, including photosynthesis, nitrogen fixation and biosynthesis of plant macromolecules.

BSOS — Behavioral and Social Sciences

BSOS 200 Introduction to Applied Behavioral and Social Sciences (3) Two lectures and one two-hour laboratory period per week. The generation and utilization of behavioral-social science knowledge. The theoretical approaches of the behavioral-social disciplines and the application of their methods of research. Differences and similarities among the disciplines and their interrelationships in the solution of problems.

BSOS 308 Contemporary Issues: Interdisciplinary Approaches (3) An interdisciplinary analysis of current public policy issue of international, national and community import. Senior standing recommended. This course may be repeated once for credit, provided a different topic is offered.

CHEM — Chemistry

CHEM 001 Introduction to College Chemistry (2) Two lectures and one recitation per week. An introduction to the study of matter. This course is recommended for students who do not qualify for MATH 110 or higher and who must take CHEM 103. Special fee. This course does not carry credit towards any degree at the University.

CHEM 102 Chemistry of Man's Environment (4) Three lectures and one three-hour laboratory per week. Non-mathematical presentation of basic chemical principles and applications in cosmochemistry, geochemistry, biochemistry, and nuclear chemistry. Emphasis on the development of man's environment and his effect upon it. This course is for the general student and does not satisfy the requirements of the professional schools. Credit may be received for only one course of the following: CHEM 102, 103, 105, 107, 111.

CHEM 103 General Chemistry I (4) Three lectures, one discussion, and one three-hour laboratory per week. Prerequisite: a satisfactory math sat score or an adequate knowledge of high school chemistry or satisfactory performance in CHEM 101. The first semester of a chemistry sequence intended for students whose curricula require a year or more of chemistry. The nature and composition of matter, chemical calculations, elements and inorganic compounds. Credit may be received for only one course of the following: CHEM 102, 103, 105, 107, 111.

CHEM 104 Fundamentals of Organic and Biochemistry (4) Three lectures, one discussion, and one three-hour laboratory per week. Prerequisite: CHEM 103 or CHEM 105. Intended for students whose curricula require one year of chemistry. Students requiring two or more years of chemistry should register for CHEM 233 OR 235. Students may not receive credit for both CHEM 104 and CHEM 233 (OR 235). The chemistry of carbon, aliphatic compounds, aromatic compounds, stereochemistry, halides, amines, and amides, acids, esters, carbohydrates, and natural products.

CHEM 105 Principles of General Chemistry I (4) Three lectures, one recitation, and one three-hour laboratory per week. A more rigorous treatment of the material of CHEM 103. Admission by invitation of the Chemistry Department based on performance on a qualifying test. Credit may be received for only one course of the following: CHEM 102, 103, 105, 107, 111.

CHEM 107 Chemistry and Man (3) Lecture course intended for non-chemistry majors. The impact of chemistry on human life. The chemistry of the universe, of life, of the body, of the mind, of food and drugs, of consumer goods, and of everyday life. Credit may be received for only one course of the following: CHEM 102, 103, 105, 107, 111.

CHEM 109 College Chemistry Laboratory (1-2) Prerequisite: consent of department. Laboratory work as required for transfer students whose lower division work at other universities has not included laboratory work.

CHEM 111 Chemistry in Modern Life (3) Two lectures and one two-hour laboratory per week. An introduction to the fundamental principles of chemistry and chemical terminology, atoms, bonding, energy, and functional groups. The course assumes no previous college science. This course fulfills the laboratory course required in the University Studies Program. Credit may be received for only one course of the following: CHEM 102, 103, 105, 107, 111.

CHEM 113 General Chemistry II (4) Three lectures, one recitation, and one three-hour laboratory per week. Prerequisite: CHEM 103 OR 105. Kinetics; homogeneous, heterogeneous, and ionic equilibria, oxidation-reduction, electrochemistry; chemistry of the elements. Credit may be received for only one of: CHEM 113 OR 115.

CHEM 115 Principles of General Chemistry II (4) Three lectures, one recitation, and one three-hour laboratory per week. Prerequisite: CHEM 103 OR 105 and consent of the Chemistry Department. A more rigorous treatment of the material in CHEM 113. Credit received for only one of: CHEM 113 OR 115.

CHEM 233 Organic Chemistry I (4) Three lectures, one discussion, and one three-hour laboratory per week. Prerequisite: CHEM 113 or 115. This course is the first of a two-semester sequence in organic chemistry and is intended to be followed by CHEM 243 or 245. The chemistry of carbon: aliphatic compounds, aromatic compounds, stereochemistry, arenes, halides, alcohols, esters, and spectroscopy. Credit may be received for only one course of: CHEM 104, 233, 235.

CHEM 235 Principles of Organic Chemistry I (4) Three lectures, one discussion, and one three-hour laboratory per week. Prerequisite: CHEM 113 OR 115 and consent of the Chemistry Department. A more rigorous treatment of the material of CHEM 233. This course is the first of a two-semester sequence in organic chemistry. Credit may be received for only one course of: CHEM 104, 233, 235.

CHEM 243 Organic Chemistry II (4) Three lectures, one recitation, and one three-hour laboratory per week. Prerequisite: CHEM 243 or 235. A continuation of CHEM 233 with emphasis on molecular structure, substitution reactions; carbonium ions, aromaticity; synthetic processes; macro-molecules. Credit may be received for only one of: CHEM 243 or 245.

CHEM 245 Principles of Organic Chemistry II (4) Three lectures, one recitation, and one three-hour laboratory per week. Prerequisite: CHEM 233 OR 235 and consent of the Chemistry Department. A more rigorous treatment of the material in CHEM 243. Credit may be received for only one of: CHEM 243 OR 245.

CHEM 287 Computer Programming for the Biological and Chemical Sciences (4) Three lectures and three hours of laboratory per week. Prerequisite: one year of college chemistry or biological science. Introduction to a structured programming language (PASCAL), with examples and applications chosen from the biological and chemical sciences.

CHEM 302 Radiochemical Safety Procedures (1) One lecture per week. A lecture and demonstration course. Radiation hazards, principles and practices of radiation safety, federal (AEC, ICC) codes and state public health.

CHEM 321 Quantitative Analysis (4) Two lectures and two three-hour laboratory periods per week. Prerequisite: CHEM 113 OR 115. Volumetric, gravimetric, electrometric, and colorimetric methods in analytical inorganic chemistry.

CHEM 374 Technology, Energy and Risk (3) Prerequisite: completion of USP Distributive Studies Area B. Decision-making in a technological, democratic society. Current issues such as acid rain, nuclear power, synthetic organic chemicals.

CHEM 398 Special Projects (2) Honors projects for undergraduate students.

CHEM 399 Introduction to Chemical Research (1-2) Prerequisite: junior standing. Registration only upon consent of the course coordinator. The course will allow students to conduct basic research under the supervision of a member of the department. May be repeated for credit to a maximum of four credits.

CHEM 401 Inorganic Chemistry (3) Three lectures per week. Prerequisite: CHEM 481.

CHEM 403 Radiochemistry (3) Three lectures per week. Prerequisite: one year of college chemistry and one year of college physics. Radioactive decay, introduction to properties of atomic nuclei, nuclear processes in cosmology, chemical, biomedical and

environmental applications of radioactivity, nuclear processes as chemical tools, interaction of radiation with matter.

CHEM 421 Advanced Quantitative Analysis (3) Pre or corequisite CHEM 482 and CHEM 483. An examination of some advanced topics in quantitative analysis including nonaqueous titrations, precipitation, phenomena, complex equilibria, and the analytical chemistry of the less familiar elements.

CHEM 423 Organic Quantitative Analysis (2) Two three-hour laboratory periods per week. Prerequisite: CHEM 243 or 245, and CHEM 113 OR 115, and consent of instructor. The semi-micro determination of carbon, hydrogen, nitrogen, halogen and certain functional groups.

CHEM 425 Instrumental Methods of Analysis (3) One lecture and two three-hour laboratory periods per week. Prerequisite: CHEM 321. An introduction to modern instrumentation in analytical chemistry. Electronics, spectroscopy, chromatography and electrochemistry.

CHEM 433 Chemical Synthesis (3) One lecture and two three-hour laboratory periods per week. Prerequisites: CHEM 113 OR 115, AND 243 OR 245.

CHEM 441 Advanced Organic Chemistry (3) Prerequisite: CHEM 481. An advanced study of the compounds of carbon, with special emphasis on molecular orbital theory and organic reaction mechanisms.

CHEM 443 Qualitative Organic Analysis (3) One lecture and two three-hour laboratory periods per week. Prerequisites: CHEM 113 OR 115, AND 243 OR 245. The systematic identification of organic compounds.

CHEM 473 Geochemistry of Solids (3) Three lectures per week. Prerequisite: CHEM 482 or GEOL 422. Principles of crystal chemistry applied to structures, properties and reactions of minerals and non-metallic solids. Emphasis is placed on the relation of structural stability to bonding, ionic size, charge, order-disorder, polymorphism, and isomorphism.

CHEM 474 Environmental Chemistry (3) Three lectures per week. Prerequisite: CHEM 481, or equivalent. The sources of various elements and chemical reactions between them in the atmosphere and hydrosphere are treated. Causes and biological effects of air and water pollution by certain elements are discussed.

CHEM 481 Physical Chemistry I (3) Prerequisites: CHEM 113 OR 115; CHEM 243 OR 245, MATH 141; PHYS 142 or PHYS 263 (PHYS 263 may be taken concurrently); or consent of instructor. A course primarily for chemists and chemical engineers.

CHEM 482 Physical Chemistry II (3) Three lectures per week. Prerequisite: CHEM 481, or consent of instructor. A course primarily for chemists and chemical engineers.

CHEM 483 Physical Chemistry Laboratory I (2) One hour lecture-recitation and one-three hour laboratory period per week. Corequisite: CHEM 481. An introduction to the principles and application of quantitative techniques in physical chemical measurements. Experiments will be coordinated with topics in CHEM 481.

CHEM 484 Physical Chemistry Laboratory II (2) One hour lecture-recitation and one-three hour laboratory period per week. Prerequisite: CHEM 481, 483; corequisite: CHEM 482. A continuation of CHEM 483. Advanced quantitative techniques necessary in physical chemical measurements. Experiments will be coordinated with topics in CHEM 482.

CHEM 485 Advanced Physical Chemistry (2) Prerequisite: CHEM 482. Quantum chemistry and other selected topics.

CHEM 486 Advanced Physical Chemistry Laboratory (2) Two three-hour laboratory periods per week. Prerequisites: CHEM 482 and consent of instructor.

CHEM 487 Computer Applications in the Biological and Chemical Sciences (4) Three lectures, one recitation, and one three-hour laboratory per week. Prerequisites: CHEM 113; CHEM 287 or equivalent; and knowledge of a scientific programming language (PASCAL, FORTRAN or "C"). The utilization of computers to solve chemical and biological problems, with emphasis on the utilization of available software rather than "de novo" programming.

CHEM 498 Special Topics in Chemistry (3) Three lectures or two lectures and one three-hour laboratory per week. Prerequisite varies with the nature of the topic being considered. Course may be repeated for credit if the subject matter is substantially different, but not more than three credits may be accepted in satisfaction of major supporting area requirements for chemistry majors.

CHIN — Chinese

CHIN 101 Intensive Elementary Chinese I (6) Introduction to speaking, reading , and writing Chinese with an emphasis on mastering the essentials of pronunciation, basic characters and structural patterns.

CHIN 102 Elementary Spoken Chinese (3) Prerequisite: CHIN 102 or equivalent. Continued study of grammatical patterns and vocabulary buildup with particular emphasis on conversation. May be taken in conjunction with CHIN 103.

CHIN 103 Elementary Written Chinese (3) Prerequisite: CHIN 101 or equivalent. Continued study of grammatical patterns and buildup of vocabulary with particular emphasis on reading and writing. May be taken in conjunction with CHIN 102.

CHIN 201 Intermediate Spoken Chinese I (3) Prerequisite: CHIN 102 or equivalent. Emphasis on development of conversational skills with vocabulary build-up and pattern drills.

CHIN 202 Intermediate Written Chinese I (3) Prerequisite: CHIN 103 or equivalent. Reading and writing skills with emphasis on grammar and Chinese characters.

CHIN 203 Intermediate Spoken Chinese II (3) Prerequisite: CHIN 201 or equivalent. Continuation of CHIN 201.

CHIN 204 Intermediate Written Chinese II (3) Prerequisite: CHIN 202 or equivalent. Continuation of CHIN 202.

CHIN 301 Advanced Chinese I (3) Prerequisite: CHIN 202 or equivalent. Readings in expository and fictional writing with conversation and composition. Not open to native speakers of Chinese.

CHIN 302 Advanced Chinese II (3) Prerequisite: CHIN 301 or equivalent. Continuation of CHIN 301. Not open to native speakers.

CHIN 303 Business Chinese I (3) Prerequisite: CHIN 203 and 204 or equivalent. Conversation, reading, and writing applicable to Chinese business transactions, social meetings, and meetings with government organizations, plus background material in English on professional business practices and social customs associated with business.

CHIN 304 Business Chinese II (3) Prerequisite: CHIN 303 or equivalent. Continuation of CHIN 303.

CHIN 313 Chinese Poetry and Prose in Translation (3) Writing of the major poets, essayists, and historians from the 10th century B.C. To the 19th century A.D. No prior knowledge of Chinese is required.

CHIN 314 Chinese Fiction and Drama in Translation (3) Representative short stories, novels, and plays on themes of love, murder, history, and the supernatural. No prior knowledge of Chinese is required.

CHIN 315 Modern Chinese Literature in Translation (3) Major works of fiction and drama from 1920 to the present read in the context of social and literary change. Emphasis on western and traditional Chinese influences on the writers and their work.

CHIN 388 Topics in Chinese Literature in Translation (3) Analysis of significant themes and structures in Chinese literature. Repeatable to a maximum of six credits.

CHIN 401 Readings in Modern Chinese I (3) Prerequisite: CHIN 302 or equivalent. Readings in history, politics, economics, sociology, and literature. Emphasis on wide-ranging, rapid reading, reinforced by conversations and compositions. Not open to native speakers of Chinese.

CHIN 402 Readings in Modern Chinese II (3) Prerequisite: CHIN 401 or equivalent. Continuation of CHIN 401. Not open to native speakers.

CHIN 403 Classical Chinese I (3) Prerequisite: CHIN 302. Introductory classical Chinese using literary and historical sources in the original language.

CHIN 404 Classical Chinese II (3) Prerequisite: CHIN 302. Further classical studies by various writers from famous ancient philosophers to prominent scholars before the new culture movement.

CHIN 405 Advanced Conversation and Composition (3) Prerequisite: CHIN 302 or permission of instructor. Practice in writing essays, letters, and reports on selected topics. Conversation directed toward everyday situations and topics related to life in china. Conducted in Chinese. Not open to native speakers.

CHIN 415 Readings in Current Newspapers and Periodicals (3) Prerequisite: CHIN 402 or equivalent. Reading of periodical literature on selected topics with discussions and essays in Chinese.

CHIN 421 Sounds and Transcriptions of Mandarin Chinese (3) Production and recognition of Mandarin speech sounds and tones, their phonological patterns, comparison with English, and representation by the various Romanization systems.

CHIN 422 Advanced Chinese Grammar (3) Chinese sentence patterns studied contrastively with English and in terms of current pedagogical as well as linguistic theories.

CHIN 431 Translation and Interpretation I (3) Prerequisite: CHIN 202 or equivalent. Introduction to the history and theories of translation/interpretation; contrastive studies of the structures of English and Chinese; development of the four language skills.

CHIN 432 Translation and Interpretation II (3) Prerequisite: CHIN 431 or equivalent.

CHIN 441 Traditional Chinese Fiction (3) Prerequisite: CHIN 314 or permission of instructor. Major works of fiction from the 4th century tales of the marvelous through the 19th century Ching novel. Taught in Chinese.

CHIN 442 Modern Chinese Fiction (3) Prerequisite: CHIN 315 or permission of instructor. Examination, through selected texts, of the writer's role as shaper and reflector of the republican and communist revolutions. Taught in Chinese.

CHIN 499 Directed Study in Chinese (1-3) Prerequisite: permission of instructor. Readings in Chinese under faculty supervision. If content differs, repeatable to a maximum of six credits.

CJUS — Institute of Criminal Justice and Criminology

CJUS 100 Introduction to Law Enforcement (3) Introduction to the administration of criminal justice in a democratic society with emphasis upon the theoretical and historical development of law enforcement. The principles of organization and administration for law enforcement; functions and specific activities; planning and research; public relations; personnel and training; inspection and control; direction, policy formulation.

CJUS 220 Investigation in Law Enforcement (3) Investigation as a process of communication. Principles and problems in information collection and evaluation; impartial gathering and evaluation of data. Crime scene search and recording; collection and preservation of physical evidence; scientific aids; modus operandi; sources of information; interviewing; follow-up and case preparation.

CJUS 230 Criminal Law in Action (3) Law as one of the methods of social control. Criminal law: its nature, sources and types; theories and historical developments. Behavioral and legal aspects of criminal acts. Classification and analysis of selected criminal offenses.

CJUS 234 Criminal Procedure and Evidence (3) Prerequisite: CJUS 230. General principles and theories of criminal procedure. Due process. Arrest, search and seizure. Recent developments. Study and evaluation of evidence and proof.

CJUS 300 Criminological and Criminal Justice Research Methods (3) Prerequisites: CJUS 100, CRIM 220 and one of the following: SOCY 201, PSYC 200, ECON 421, BMGT 230, EDMS 451 or GVPT 422. Introduction to the formulation of research questions covering crime and justice, research designs, data

collection, and interpretation and reporting in criminological and justice-system settings

CJUS 320 Introduction to Criminalistics (3) Two hours of lecture and two hours of laboratory per week. Prerequisites CJUS 220 and consent of instructor. An introduction to modern methods used in the detection, investigation and solution of crimes. Practical analysis of evidence in a criminal investigation laboratory, including photography, fingerprints and other impressions, ballistics, glass, hair, handwriting and document examination, drug analysis, and lie detection.

CJUS 330 Contemporary Legal Policy Issues (3) Prerequisites CJUS 230 and 234 or equivalent. In-depth examination of selected topics. Criminal responsibility. Socio-legal policy alternatives with regard to deviance. Law enforcement procedures for civil law and similar legal problems. Admissibility of evidence. Representation. Indigent's right to counsel.

CJUS 340 Concepts of Law Enforcement Administration (3) Prerequisite CJUS 100 or equivalent. An introduction to concepts of organization and management as these relate to law enforcement. Principles of structure, process, policy and procedure, communication and authority, division of work and organizational controls. Human element in the organization. Informal interaction and bureaucracy.

CJUS 350 Law Enforcement-Community Relations (3) Prerequisite CJUS 100 or equivalent. Examination of factors contributing to cooperation or friction between law enforcement personnel and the community, with emphasis on minority groups, political pressures and cultural problems. Community organization and social responsibility of law enforcement.

CJUS 360 Industrial and Retail Security Administration (3) Prerequisite CJUS 100, 220 or consent of instructor. The origins of contemporary private security systems. Organization and management of industrial and retail protective units.

CJUS 388 Independent Reading in Law Enforcement (3) H - Honors. Prerequisite consent of instructor. Supervised study of selected topic in criminal justice. Repeatable to a maximum of six credits.

CJUS 389 Independent Research in Law Enforcement (3) H - Honors. Prerequisite: consent of instructor. Supervised study of selected topic in criminal justice. Repeatable to a maximum of six credits.

CJUS 398 Law Enforcement Field Training (1-3) Prerequisites 6 credits of law enforcement, consent of instructor. Supervised, structured and focused field training in law enforcement agencies. Repeatable to a maximum of six credits.

CJUS 399 Directed Independent Research (1-3) Prerequisites 12 credit hours in law enforcement or criminology, consent of instructor. Supervised individual research and study, library and field research, surveys, special local problems. Repeatable to a maximum of six credits.

CJUS 400 Criminal Courts (3) Prerequisites CJUS 100 or consent of instructor. Criminal courts in the United States at all levels: judges, prosecutors, defenders, clerks, court administrators, and the nature of their jobs; problems facing courts and prosecutors today and problems of administration, reforms.

CJUS 444 Advanced Law Enforcement Administration (3) Prerequisite: CJUS 340 or consent of instructor. The structuring of manpower, material, and systems to accomplish the major goals of social control. Personnel and systems management. Political controls and limitations on authority and jurisdiction.

CJUS 455 Dynamics of Planned Change in Criminal Justice I (3) Prerequisite: consent of instructor. An examination of conceptual and practical issues related to planned change in criminal justice. Emphasis on the development of innovative ideas using a research and development approach to change.

CJUS 456 Dynamics of Planned Change in Criminal Justice II (3) Prerequisite: CJUS 455 or consent of instructor. An examination of conceptual and practical issues related to planned change in criminal justice. Emphasis on change strategies and tactics which are appropriate for criminal justice personnel in entry level positions.

CJUS 462 Special Problems in Security Administration (3) Prerequisites: CJUS 360 and consent of instructor. An advanced course for students desiring to focus on specific concerns in the study of private security organizations, business intelligence and espionage, vulnerability and criticality analyses in physical security, transportation, banking, hospital and military security problems; uniformed security forces; national defense information, and others.

CJUS 498 Selected Topics in Criminal Justice (1-6) Prerequisite: consent of instructor. Supervised study of a selected topic to be announced in the field of criminal justice. Repeatable to a maximum of six credits.

CLAS — Classics

CLAS 170 Greek and Roman Mythology (3) Taught in English, no prerequisite cannot be taken for language credit. This course is particularly recommended for students planning to major in foreign languages, English, history, the fine arts, or journalism.

CLAS 280 English Word Building From Latin and Greek (3) General English vocabulary through the study of Latin and Greek roots, prefixes, suffixes, etymologies, and principles of linguistic change.

CLAS 290 Greek and Latin Medical Terminology (3) Basic medical vocabulary through the study of Greek and Latin roots, prefixes and suffixes. No previous knowledge of Greek or Latin required.

CLAS 309 Special Topics in Classical Literature (3) May be repeated to a maximum of nine hours when the topics differ. May not be counted toward a major in Latin or a concentration in Greek. Readings in translation.

CLAS 320 Women in Classical Antiquity (3) A study of women's image and reality in ancient Greek and Roman societies through an examination of literary, linguistic, historical, legal and artistic evidence, special emphasis in women's role in the family, views of female sexuality, and the place of women in creative art. Readings in primary sources in translation and modern critical writings.

CLAS 370 Greek Literature in Translation (3) Selections in translation of Greek literature from Homer to Lucian, with special emphasis on epic and dramatic poetry. No knowledge of Greek or Latin is required.

CLAS 371 Latin Literature in Translation (3) Selections in translation of Latin literature to the time of Apuleius. Special emphasis will be placed on poetry of the Augustan Age. No knowledge of Latin is required. Cannot be counted towards a major in Latin. Students may not receive credit for both LATN 370 and CLAS 371.

CLAS 374 Greek Tragedy in Translation (3) Study and analysis of the tragedies of Aeschylus, Sophocles and Euripides with special attention to the concepts of character and of thought as conceived by Aristotle in The Poetics.

CLAS 470 Advanced Greek and Roman Mythology (3) Prerequisites: CLAS 170 or permission of instructor. Selected themes and characters of Greek and Roman myth. History of the study of myth and research methods in mythology.

CMLT — Comparative Literature

CMLT 401 Introductory Survey of Comparative Literature (3) Survey of the background of European literature through study of Greek and Latin literature in English translations, discussing the debt of modern literature to the ancients.

CMLT 402 Introductory Survey of Comparative Literature (3) Study of the medieval and modern continental literature.

CMLT 411 The Greek Drama (3) The chief works of Aeschylus, Sophocles, Euripides, and Aristophanes in English translations. Emphasis on the historic background, on dramatic structure, and on the effect of the Attic drama upon the mind of the civilized world.

CMLT 415 The Old Testament As Literature (3) A study of sources, development and literary types.

CMLT 416 New Testament As Literature (3) A study of the books of the New Testament with attention to the relevant historical background and to the transmission of the text. A knowledge of Greek is helpful, but not essential.

CMLT 421 The Classical Tradition and Its Influence in the Middle Ages and the Renaissance (3) Emphasis on major writers. Reading knowledge of Greek or Latin required.

CMLT 422 The Classical Tradition and Its Influence in the Middle Ages and the Renaissance (3) Emphasis on major writers. Reading knowledge of Greek or Latin required.

CMLT 430 Literature of the Middle Ages (3) Narrative, dramatic and lyric literature of the middle ages studied in translation.

CMLT 433 Dante and the Romance Tradition (3) A reading of the divine comedy to enlighten the discovery of reality in western literature.

CMLT 461 Romanticism: Early Stages (3) Emphasis on England, France and Germany. Reading knowledge of French or German required.

CMLT 462 Romanticism: Flowering and Influence (3) Emphasis on England, France and Germany. Reading knowledge of French or German required.

CMLT 469 The Continental Novel (3) The novel in translation from Stendhal through the existentialists, selected from literatures of France, Germany, Italy, Russia, and Spain.

CMLT 470 Ibsen and the Continental Drama (3) Emphasis on the major work of Ibsen, with some attention given to selected predecessors, contemporaries and successors.

CMLT 479 Major Contemporary Authors (3)

CMLT 488 Genres (3) A study of a recognized literary form, such as tragedy, epic, satire, literary criticism, comedy tragicomedy, etc. The course may be repeated for cumulative credit up to six hours when different material is presented.

CMLT 489 Major Writers (3) Each semester two major writers from different cultures and languages will be studied. Authors will be chosen on the basis of significant relationships of cultural and aesthetic contexts, analogies between their respective works, and the importance of each writer to his literary tradition.

CMLT 496 Conference Course in Comparative Literature (3) Second semester. A tutorial type discussion course, correlating the courses in various literatures which the student has previously taken with the primary themes and masterpieces of world literature. This course is required of undergraduate majors in comparative literature, but must not be taken until the final year of the student's program.

CMLT 498 Selected Topics in Comparative Literature (3)

CMSC — Computer Science

CMSC 103 Introduction to Computing (3) Two lectures and one two-hour laboratory period each week. Basic concepts of Fortran. Elements of computer organization. Algorithms in the computational solution of problems. Survey of non-numeric and numeric applications. Programming projects. Credit will be given for only one course, CMSC 103 or CMSC 110.

CMSC 110 Introduction to Fortran Programming (4) Three lectures and two hours of laboratory each week. Pre- or co-requisite: MATH 140 or 220. Construction of algorithms and the efficient solution of computational problems. Conducted in FORTRAN. Intended for scientists, engineers, and business majors. Not applicable to the major requirements in computer science. Credit will be given for only one course, CMSC 103 or 110.

CMSC 112 Computer Science I (4) Three hours of lecture and two hours of laboratory per week. Pre- or corequisite: MATH 140. Design and analysis of programs using structured programming and data abstraction. Formal syntax and semantics, and program verification. Conducted in Pascal. Intended for computer science majors.

CMSC 113 Computer Science II (4) Three hours of lecture and two hours of laboratory per week. Prerequisite: CMSC 112. Pre- or corequisite: MATH 141. A continuation of CMSC 112. Intended for computer science majors. Credit will be given for only one course, CMSC 113, 120 or 122.

CMSC 120 Introduction to Pascal Programming (4) Three hours of lecture and two hours of laboratory per week. Prerequisite: MATH 110. Design and analysis of programs in Pascal. An introduction to computing, using structured programming concepts. Not applicable to the major requirements in computer science. Credit will be given for only one course: CMSC 113, 120 or 122.

CMSC 211 Assembly Language Programming (3) Two lectures and two laboratories per week. Prerequisite: CMSC 120 or CMSC 122. Assembly language programming, assemblers, loaders, linkage editors, and macros.

CMSC 220 Introduction to File Processing (3) Prerequisite: CMSC 120 or CMSC 122. Characteristics and use of peripheral memory devices for sequential and direct access file processing. Techniques such as sorting and searching, hash coding, and table look-up.

CMSC 250 Introduction to Discrete Structures (3) Prerequisite: CMSC 110 or CMSC 112; MATH 111 or equivalent. Fundamental mathematical concepts and algebraic structures, such as sets, relations, functions, semigroups, monoids, and Boolean algebras. Introduction to the theory of graphs and trees and their realization as computer programs. Emphasis on examples and applications rather than mathematical rigor.

CMSC 311 Computer Organization (3) Prerequisite: CMSC 122. Introduction to assembly language. Design of digital logic circuits. Organization of central processors, including instruction sets, register transfer operations, control microprogramming, data representation, and arithmetic algorithms. Memory and input/output organization.

CMSC 330 Organization of Programming Languages (3) Prerequisite: CMSC 122. The run-time organization of programming languages. Algebraic languages (e.g. Algol, Simpl, PL/1, Pascal) via their in-time storage structures. Dynamic versus static activation records. Storage for strings and arrays. Interpretive systems such as APL and SNOBOL4.

CMSC 388 Special Computational Laboratory (1-2) Two hours laboratory per week for each credit hour. Prerequisite: CMSC 103 or equivalent. Arranged for special groups of students to give experience in developing algorithmic solutions of problems or using particular computational systems. May be taken for cumulative credit up to a maximum of six hours where different material is covered.

CMSC 390 Honors Paper (3) Prerequisite: admission to CMSC Honors Program. Special study or research directed toward preparation of honors paper.

CMSC 400 Introduction to Computer Languages and Systems (3) Prerequisite: MATH 241 or equivalent. A terminal course suitable for non-CMSC majors with no programming background. Organization and characteristics of computers. Procedure oriented and assembly languages. Representation of data, characters and instructions. Introduction to logic design and systems organization. Macro definition and generation. Program segmentation and linkage. Extensive use of the computer to complete projects illustrating programming techniques and machine structure. (CMSC 400 may not be counted for credit in the graduate program in computer science.)

CMSC 411 Computer System Architecture (3) Prerequisite: CMSC 311 or equivalent. Input/output processors and techniques. Intra-system communication, buses, caches. Addressing and memory hierarchies. Microprogramming, parallelism, and pipeling.

CMSC 412 Operating Systems (3) Prerequisite: CMSC 311 or equivalent. An introduction to batch systems, spooling systems, and third-generation multiprogramming systems. Description of the parts of an operating system in terms of function, structure, and implementation. Basic resource allocation policies.

CMSC 415 Systems Programming (3) Prerequisite: CMSC 412. Basic algorithms of operating system software. Memory management using linkage editors and loaders, dynamic relocation with base registers, paging. File systems and input/output control. Processor allocation for multiprogramming, timesharing. Emphasis on practical systems programming, including projects such as a simple linkage editor, a stand-alone executive, a file system, etc.

CMSC 420 Data Structures (3) Prerequisite: CMSC 220 or equivalent. Description, properties, and storage allocation of data structures including lists and trees. Algorithms for manipulating structures. Applications from areas such as data processing, information retrieval, symbol manipulation, and operating systems.

CMSC 424 Database Design (3) Prerequisites: CMSC 220 and CMSC 420. (CMSC 450 recommended.) Motivation for the database approach as a mechanism for modelling the real world. Review of the three popular data models: relational, network, and hierarchical. Comparison of permissible structures, integrity constraints, storage strategies, and query facilities. Theory of database design logic.

CMSC 426 Image Processing (3) Prerequisite: CMSC 420 or equivalent. An introduction to basic techniques of analysis and manipulation of pictorial data by computer. Image input/output devices, image processing software, enhancement, segmentation, property measurement, Fourier analysis. Computer encoding, processing, and analysis of curves.

CMSC 430 Theory of Language Translation (3) Prerequisite: CMSC 330. Formal translation of programming languages, program syntax and semantics. Finite state grammars and recognizers. Context- free parsing techniques such as recursive descent, prededence, LL(K), LR(K) and SLR(K). Machine independent code improvement and generation, syntax-directed translation schema.

CMSC 432 Compiler Writing (3) Prerequisites: CMSC 220, 330, 430. A detailed examination of a compiler for an algebraic language designed around the writing of a compiler as the major part of the course. Scanning and parsing, code generation, optimization and error recovery, and compiler-writing techniques such as bootstrapping and translator writing systems.

CMSC 434 Human Factors in Computer and Information Systems (3) Prerequisites: CMSC 330, PSYC 100, and STAT 400. Human factors issues in the development of software, the use of database systems, and the design of interactive computer systems. Experimentation on programming language control and data structures, programming style issues, documentation, program development strategies, debugging, and readability will be emphasized. Interactive system design issues such as response time, display rates, graphics, on-line assistance, command language, menu selection, or speech input/output.

CMSC 435 Software Design and Development (3) Prerequisite: CMSC 420 AND 430, or equivalent. State-of-the-art techniques in software design and development. Laboratory experience in applying the techniques covered. Structured design, structured programming, top-down design and development, segmentation and modularization techniques, iterative enhancement, design and code inspection techniques, correctness, and chief-programmer teams. The development of a large software project.

CMSC 450 Elementary Logic and Algorithms (3) Prerequisite: MATH 240 or consent of instructor. This is the same course as MATH 444. An elementary development of propositional logic, predicate logic, set algebra, and Boolean algebra, with a discussion of Markov algorithms, turing machines and recursive functions. Topics include post productions, word problems, and formal languages.

CMSC 451 Design and Analysis of Computer Algorithms (3) Prerequisites: CMSC 122 and CMSC 250. CMSC 420 recommended. Fundamental techniques for designing and analyzing computer algorithms. Basic methods include Greedy methods, divide-and-conquer techniques, search and traversal techniques, dynamic programming, backtracking methods, branch-and-bound methods, and algebraic transformations.

CMSC 452 Elementary Theory of Computation (3) Prerequisites: CMSC 122 and 250. Introduction to alternative theoretical models of computation, types of automata, and their relations to formal grammars and languages.

CMSC 456 Data Encryption and Security (3) Prerequisite: CMSC 420 and CMSC 451. Methods of protecting computer data from unauthorized use and users by data encryption and by access and information controls. Classical cryptographic systems. Introduction to several modern systems such as Data Encryption Standard and public-key cryptosystems.

CMSC 460 Computational Methods (3) Prerequisites: MATH 240 and 241, CMSC 110 or 122. Basic computational methods for interpolation, least squares, approximation, numerical quadrature, numerical solution of polynomial and transcendental equations, systems of linear equations and initial value problems for ordinary differential equations. Emphasis on the methods and their computational properties rather than on their analytic aspects. Listed also as MAPL 460. (Credit will be given for only one of the courses, CMSC 460 or CMSC 470.)

CMSC 470 Numerical Mathematics: Analysis (3) Prerequisites: MATH 240 AND 241, CMSC 110 or 122. The first half of a one-year introduction to numerical analysis at the advanced undergraduate level, supplemented with programming assignments. Interpolation, numerical differentiation and integration, solution of nonlinear equations, acceleration of convergence, numerical treatment of differential equations. Listed also as MAPL 470. (Credit will be given for only one of the courses, CMSC 460 or CMSC 470.)

CMSC 471 Numerical Mathematics: Linear Algebra (3) Prerequisites: MATH 240 AND 241, CMSC 110 or 122. The course, with MAPL/CMSC 470, forms a one-year introduction to numerical analysis at the advanced undergraduate level. Direct solution of linear systems, norms, least squares problems, the symmetric eigenvalue problem, basic iterative methods. Topics will be supplemented with programming assignments. (Listed also as MAPL 471.)

CMSC 475 Combinatorics and Graph Theory (3) Prerequisite: MATH 240 and MATH 241. General enumeration methods, difference equations, generating functions. Elements of graph theory, matrix representations of graphs, applications of graph theory to transport networks, matching theory and graphical algorithms. (Also listed as MATH 475.)

CMSC 477 Optimization (3) Prerequisite: MATH 401 or MATH 405. CMSC 110 or 122. Linear programming including the simplex algorithm and dual linear programs, convex sets and elements of convex programming, combinatorial optimization integer programming. (Listed also as MAPL 477.)

CMSC 498 Special Problems in Computer Science (1-3) Prerequisite: permission of instructor. An individualized course designed to allow a student or students to pursue a specialized topic or project under the supervision of the senior staff. Credit according to work done.

CNEC — Consumer Economics

CNEC 100 Introduction to Consumer Economics (3) The role of the consumer in modern society. Topics include the consumer in the market, the impact of market failures on the quality of life and the impact of government and business' decisions on consumer welfare.

CNEC 310 Consumer Economics and Public Policy (3) Prerequisites: ECON 201 AND 203. The application of economic theory, including benefit-cost analysis, to an evaluation of policy decisions in the private and public sectors which affect the consumer. The economic, social, and political framework within which policy decisions are made.

CNEC 385 Junior Honors Seminar (1) Spring semester. Limited to juniors in the departmental honors program. Readings, reports and discussion of selected topics.

CNEC 396 Field Work and Analysis in Consumer Economics (3-6) Supervised, professional field work experience in business, industry, government or education. A seminar and a written critique of the field work experience will be required to relate formal academic study to student work experiences. Students must apply a semester in advance and enrollment is by permission of the department and is limited to majors.

CNEC 400 Research Methods (3) Prerequisite: MATH 110 OR 115. Research methodology in textiles and consumer economics, with particular emphasis on the application of statistical concepts and techniques to the analysis of data from the areas of textiles and consumer economics. May not be taken by students who have credit in TEXT 400.

CNEC 410 Consumer Finance (3) Prerequisites: ECON 201 AND 203. An economic approach to the problems of income allocation and consumer financial planning, including income maximization, principles of asset choice, financial management and risk management. The effects of fiscal and monetary policies on lifetime economic planning. May not be taken by students who have credit for FMCD 441.

CNEC 431 The Consumer and the Law (3) Three lectures a week. A study of legislation affecting consumer goods and services. Topics covered include product safety and liability, packaging and labeling, deceptive advertising, and consumer credit. The implications of such legislation for consumer welfare with particular emphasis on the disadvantaged groups in our society will be examined.

CNEC 433 Consumer Law: Advertising and Solicitation (3) Prerequisite - CNEC 431 or consent of instructor. An advanced study of the legal consequences of inducing consumers to enter into commercial transactions. Individual consumer remedies, collective consumer remedies and government regulation.

CNEC 435 Economics of Consumption (3) Spring semester. Three lectures per week. Prerequisites: ECON 201 AND 203 or ECON 205 for non-majors. The application of economic theory to a study of consumer decision-making and its role in a market economy at both the individual and aggregate levels. Topics covered include empirical studies of consumer spending and saving, the consumer in the market and collective consumption.

CNEC 437 Consumer Behavior (3) Three lectures per week. Prerequisites: PSYC 100 and SOCY 100. An application of the behavioral sciences to a study of consumer behavior. Current theories, models and empirical research findings are explored.

CNEC 455 Product Standards (3) Prerequisite: consent of instructor. The process of product standard development, and the significance of such standards to the consumer. History, procedures and uses of standards by industry and government, including both voluntary and regulatory standardization; the impact of product standards, and mechanisms for obtaining consumer input in the standardization process.

CNEC 456 Product Liability and Government Regulation (3) Prerequisite: CNEC 431 or consent of instructor. Legal concepts involved in society's determination of consumer's rights to product safety. Litigation determining the obligation of manufacturers and sellers to injured consumers. Government regulations defining the obligations of manufacturers to design and construct products in accordance with government standards.

CNEC 457 Product Safety (3) Prerequisite: consent of instructor. An interdisciplinary investigation of consumer product safety. Major statutes and agencies regulating safety. Alternative means of promoting consumer product safety. The application of product liability and cost benefit analysis to the economics of product safety. Consumer response to safety labeling, advertising and educational efforts.

CNEC 488 Senior Honors Thesis (1-4) Limited to undergraduate students in the departmental honors program. An independent literary, laboratory or field study, conducted throughout the student's senior year. Student should register in both fall and spring.

CNEC 498 Special Studies (2-4) Independent study by an individual student or by a group of students in advanced work not otherwise provided in the department. Students must prepare a description of the study they wish to undertake. The plan must be approved by the faculty directing the study and the department chairman.

COOP — Cooperative Education Program

COOP 208 Coop Work Experience I (0) Prerequisites: satisfactory completion of 36 credits, and consent of the director of the cooperative education program. Practical, full-time work experience in either private or government agencies which supplements and enhances the theories, principles and practices in the normal education program. The student must register for COOP 208 for each summer work experience and for both COOP 208 AND 209 for each semester work experience.

COOP 209 Coop Work Experience II (0) Prerequisites: satisfactory completion of 36 credits, and consent of the Director of the Cooperative Education Program. Practical, full-time work experience in either private or government agencies which supplements and enhances the theories, principles and practices in the normal education program. The student must register for COOP 208 for each summer work experience and for both COOP 208 AND 209 for each semester work experience.

CRIM — Criminology

CRIM 220 Criminology (3) Prerequisites: SOCY 100 and sophomore standing. Criminal behavior and the methods of its study, causation, typologies of criminal acts and offenders, punishment, correction and incapacitation, prevention of crime.

CRIM 359 Field Training in Criminology and Corrections (1-3) Prerequisites: 6 credits of criminology and consent of instructor. Supervised field training in public or private social agencies. Group meetings, individual conferences and written program reports. Repeatable to a maximum of six credits.

CRIM 360 Victimology (3) Prerequisites: CRIM 220 or consent of instructor. Overview of the history and theory of victimology. Analysis of victimization patterns with special emphasis on types of victims and crimes. The interaction between victims of crime and the criminal justice system with respect to the role of the victim and the services offered to the victim.

CRIM 388 Independent Reading Course in Criminology (3) Prerequisite: SOCY 100. For honors students only. This course is designed for the needs of honors students in criminology.

CRIM 389 Independent Research in Criminology (3) Prerequisite: SOCY 100. For honors students only. This course is designed for the needs of the honors students in criminology.

CRIM 399 Independent Study in Criminology (1-3) Prerequisites: 12 credits in criminology or law enforcement, consent of instructor. Integrated reading or research under direction and supervision of a faculty member. Repeatable to a maximum of six credits.

CRIM 432 Law of Corrections (3) Prerequisite: LENF 230 OR 234 and CRIM 220. A review of the law of criminal corrections from sentencing to final release or release on parole. Probation, punishments, special treatments for special offenders, parole and pardon, and the prisoner's civil rights are also examined.

CRIM 450 Juvenile Delinquency (3) Prerequisite: SOCY 100. Juvenile delinquency in relation to the general problem of crime, analysis of factors underlying juvenile delinquency, treatment and prevention.

CRIM 451 Crime and Delinquency Prevention (3) Prerequisites: CRIM 220 or CRIM 450 or consent of instructor. Methods and programs in prevention of crime and delinquency.

CRIM 452 Treatment of Criminals and Delinquents in the Community (3) Prerequisite: CRIM 220 or CRIM 450 or consent of instructor. Analysis of the processes and methods in the modification of criminal patterns of behavior in a community setting.

CRIM 453 Institutional Treatment of Criminals and Delinquents (3) Prerequisite: CRIM 220 or CRIM 450 or consent of instructor. History, organization and functions of penal and correctional institutions for adults and juveniles.

CRIM 454 Contemporary Criminological Theory (3) Prerequisite: CRIM 220, CRIM 450, and CRIM 451 or CRIM 452 or CRIM 453. Brief historical overview of criminological theory up to the 50's. Deviance Labeling. Typologies. Most recent research in criminalistic subcultures and middle class delinquency. Recent proposals for "decriminalization".

CRIM 455 Psychology of Criminal Behavior (3) Prerequisites: CRIM 220 or equivalent and PSYC 331 or equivalent. Biological, environmental, and personality factors which influence criminal behaviors. Biophysiology and crime, stress and crime, maladjustment patterns, psychoses, personality disorders, aggression and violent crime, sex-motivated crime and sexual deviations, alcohol and drug abuse, and criminal behavior.

CRIM 498 Selected Topics in Criminology (3) Topics of special interest to advanced undergraduates in criminology. Such courses will be offered in response to student request and faculty interest. No more than six credits may be taken by a student in selected topics.

DANC — Dance

DANC 100 Modern Dance I For Non-Majors (2) Basic principles of modern dance, emphasizing fundamentals of movement.

DANC 102 Rhythmic Training For Dance (2) Basic approaches to rhythmic principles related to dance.

DANC 104 Modern Dance II For Non-Majors (2) Prerequisite: DANC 100. A continuation of the principles introduced in DANC 100.

DANC 109 Improvisation I (2) Pre- or corequisite: DANC 100 OR 148. An introduction to the process of spontaneous movement discovery. Repeatable to a maximum of 4 credits only with permission of instructor.

DANC 124 Ballet I For Non-Majors (2) Barre and center work for alignment, strength, flexibility and coordination. Introduction to ballet terminology.

DANC 127 Ballet II For Non-majors (2) Prerequisite: DANC 124 or audition. Continuation of DANC 124.

DANC 128 Ballet I For Majors Only (2) Barre and center work for alignment, strength, flexibility and coordination. Introduction to ballet terminology. Repeatable to a maximum of 4 credits only with permission of instructor.

DANC 129 Ballet II For Majors Only (2) Prerequisite: DANC 128 or audition. Continuation of DANC 128. Repeatable to a maximum of 4 credits only with permission of instructor.

DANC 138 Introduction to Ethnic Dance (2) Traditional dances and music of selected cultures. Repeatable to a maximum of 4 credits only with permission of instructor.

DANC 148 Modern Dance I For Majors Only (3) A study of dance movement: placement, rhythm, dynamics, space and dance phrases. Repeatable to a maximum of 6 credits only with permission of instructor.

DANC 149 Modern Dance II For Majors Only (3) Prerequisite: DANC 148 or audition. Continuation of DANC 148. Repeatable to a maximum of 6 credits only with permission of instructor.

DANC 154 Jazz I For Non-Majors (2) Introduction to the jazz style in dance for the beginning student.

DANC 158 Jazz I For Majors Only (2) Introduction to the jazz style in dance for the beginning student. Repeatable to a maximum for 4 credits only with permission of instructor.

DANC 165 Dance Notation I (3) Prerequisite: DANC 102 and either DANC 100 or DANC 148. Movement analysis for purposes of recording dance, notation fundamentals. Elementary writing of technique, reading of simple modern, ballet and ethnic studies.

DANC 171 Movement Integration (2) One lecture and two laboratory periods per week. Techniques for reducing tension and achieving integrated muscular control and coordination.

DANC 199 Dance Workshop I (1-2) Planning, performance, choreography, production and presentation of student works, both on and off campus. May be repeated to a maximum of 4 credits.

DANC 200 Introduction to Dance (3) A study of dance as a form of communication and as an art form; a survey of the theories and styles of dance, and their relationships to other art forms.

DANC 204 Modern Dance III For Non-majors (2) Prerequisite: DANC 104 or audition. Continuation of DANC 104.

DANC 208 Choreography I (3) Prerequisite: DANC 102 and DANC 109. Basic principles of dance composition: space, time dynamics, and movement invention. The development of critical awareness. Repeatable to a maximum of six credits only with permission of instructor.

DANC 210 Dance Production I (3) Two lectures and two laboratory periods per week. A survey of theatre crafts and techniques involved in dance production, including lighting, sound, set and costume design and

construction, publicity and promotion, management and administration, stage-management and videotaping.

DANC 228 Ballet III (2) Prerequisite: DANC 129 or audition. Execution of the vocabulary of ballet movement with technical accuracy. Beginning combinations across the floor. Repeatable to a maximum of 4 credits.

DANC 229 Ballet IV (2) Prerequisite: DANC 228 or audition. Continuation of DANC 228. Repeatable to a maximum of four credits.

DANC 248 Modern Dance III For Majors Only (3) Prerequisite: DANC 149 or audition. The body as an instrument of expression, techniques for increasing kinesthetic sensitivity. Repeatable to a maximum of 6 credits.

DANC 249 Modern Dance IV (3) Prerequisite: DANC 248 or audition. Continuation of DANC 248. Repeatable to a maximum of 6 credits.

DANC 258 Jazz II (2) Prerequisite: DANC 154 OR 158; DANC 104 OR 149 or audition. A history of jazz through movement from its tribal roots to the American dance styles of the 1950's. Repeatable to a maximum of 4 credits only with permission of instructor.

DANC 265 Dance Notation II (3) Prerequisite: DANC 165 or equivalent. Reading, writing and performing movement scores.

DANC 271 Movement Therapy (3) Two lectures and two laboratory periods per week. Personal and conceptual exploration of movement to increase body awareness, self-understanding, and non-verbal communication.

DANC 280 Prevention and Treatment of Dance Injuries (2) One lecture and two laboratory periods per week. Theories of the care of the body, including warm-up and cool-down exercises, nutrition, constructive rest, hydro-therapy, massage, bandaging, taping and first-aid.

DANC 299 Dance Workshop II (1-2) Prerequisite: DANC 199 or permission of instructor. Continuation of DANC 199. May be repeated to a maximum of 4 credits.

DANC 302 Music Sources For Dance (3) Prerequisite: DANC 102 or permission of the instructor. Study of musical literature, improvisation and composition as they relate to dance. Techniques of instrumental accompaniment.

DANC 305 Principles of Teaching Dance (3) Two lecture and two laboratory periods per week. Prerequisite: DANC 102, 208 AND 249. Theory and practice of dance instruction including methods, lesson plans and practice teaching.

DANC 308 Choreography II (3) Prerequisite: DANC 165 AND 208. Exploration of the formal elements of choreography: theme, development, repetition, contrast, transition, continuity and structure.

DANC 309 Improvisation II (2) Prerequisite: DANC 109 or audition. Continuation of DANC 109. Repeatable to a maximum of 4 credits.

DANC 310 Dance Lighting (3) Two lectures and two laboratory periods per week. Prerequisite: DANC 210. Theory and pratice of stage lighting with specific reference to designing for dance.

DANC 311 Dance Costuming (3) One lecture and four laboratory periods per week. Prerequisite: DANC 210. Theory and practice of the design and production of costumes for dance.

DANC 328 Ballet V (2) Prerequisite: DANC 229 or audition. Complex combinations of ballet movements at the barre, in center, and across the floor. Repeatable to a maximum of 4 credits.

DANC 329 Ballet VI (2) Prerequisite: DANC 328 or audition. Continuation of DANC 328. Repeatable to a maximum of 4 credits.

DANC 338 Ethnic Dance Styles (3) One lecture and four labs. Prerequisite: DANC 138. Continuation of DANC 138. Heritage and customs as they relate to performance and style.

DANC 348 Modern Dance V (3) Prerequisite: DANC 249 or audition. Complex phrases of modern dance movement with emphasis on articulation and expression. Repeatable to a maximum of 6 credits.

DANC 349 Modern Dance VI (3) Prerequisite: DANC 348 or audition. Continuation of DANC 348. Repeatable to a maximum of 6 credits.

DANC 358 Jazz III (2) Prerequisite: DANC 258 or audition. Contemporary jazz trends and styles from 1950 to the present. Repeatable to a maximum of 4 credits.

DANC 359 Jazz IV (2) Prerequisite: DANC 358 or audition. Advanced jazz techniques. Performance emphasis. Repeatable to a maximun of 4 credits.

DANC 365 Effort Shape (3) Prerequisite: DANC 165. Introduction to Rudolf Laban's system of qualitative movement analysis in relation to understanding personal movement style. Application to dance performance, teaching, composition and research.

DANC 368 Fundamentals of Performing (1-3) Prerequisite: DANC 249 or audition. The development of concentration, kinesthetic awareness, spatial projection and theatrical nuances through individual coaching. For choreographers as well as performers. Repeatable to a maximum of 3 credits.

DANC 371 Creative Dance For Children (3) Prerequisite: DANC 208 AND 305, or equivalent. Directing the essential elements of dance to the level of the child's experience and facilitating the creative response. The development of movement into simple forms to serve as a symbol of individual expression.

DANC 380 Kinesiology For Dancers (4) Prerequisite: DANC 104 OR 149. A study of the biological and physical principles of movement and the effects of dancing upon the structure and function of the human body.

DANC 398 Directed Studies in Dance (1-6) Prerequisite: permission of the department chairman. Repeatable to a maximum of 6 credits.

DANC 399 Dance Workshop III (1-2) Prerequisite: DANC 299 or permission of instructor. Continuation of DANC 299. May be repeated to a maximum of 4 credits.

DANC 408 Choreography III (3) Prerequisite: DANC 308 or audition. Theoretical and creative aspects of choreography for small groups. Emphasis on individual projects. Repeatable to a maximum of 6 credits.

DANC 410 Dance Production II (3) One lecture and four labs. Prerequisite: DANC 210. Continuation of DANC 210.

DANC 411 Dance Management and Administration (3) Prerequisite: DANC 210. Principles of dance management and administration, including organization of touring, bookings, budgets, public relations, grantsmanship and audience development.

DANC 428 Principles of Pointe Work and Partnering (2) Prerequisite: DANC 329 or audition. An introduction to pointe work for the advanced female student pursuing the tradition of classical ballet. Principles of partnering for the male dance student. Repeatable to a maximum of 4 credits.

DANC 429 Ballet Variations and Repertory (3) Pre- or corequisite: DANC 428. Choreography, music, scenario and staging of standard works in ballet. Repeatable to a maximum of 6 credits.

DANC 430 Dance Ethnology (3) Social and cultural aspects of dance in world cultures with emphasis on non-western peoples.

DANC 448 Modern Dance VII (3) Prerequisite: DANC 349 or audition. Advanced technique in contemporary dance with emphasis on physical and expressive skills. Repeatable to a maximum of 6 credits.

DANC 449 Modern Dance VIII (3) Prerequisite: DANC 448 or audition. Intensive work in modern technique for the professionally oriented dancer. Repeatable to a maximum of 6 credits.

DANC 468 Modern Repertory (3) Prerequisite: DANC 165 AND 249 and permission of the instructor. The form, content, music, design and performance of selected works of well known modern choreographers, including Humphrey, Graham and Limon. Repeatable to a maximum of 6 credits.

DANC 471 Movement Behavior (3) Prerequisite: DANC 165. The social psychology of movement; reciprocity of physical and emotional behavior.

DANC 482 History of Dance I (3) The development of dance from primitive times to the middle ages and the relationship of dance forms to patterns of culture.

DANC 483 History of Dance II (3) The development of dance from the Renaissance period to the present time and the relationship of dance forms to patterns of culture.

DANC 484 Philosophy of Dance (3) Prerequisite: DANC 482, OR 483 or permission of instructor. Critical analysis of dance as a creative experience and the role of professional, educational and recreational dance in our society. Study of selected approaches to current developments in dance.

DANC 485 Survey of Dance Literature (3) Prerequisite: DANC 482 AND 483. Research methods and bibliography in dance.

DANC 486 Movement and Media (3) Two lectures and two laboratory periods. Prerequisite: permission of instructor. Theory and pratice of recording solo and group dances on film and video-tape. Analysis of significant dance films, photographic lighting and editing techniques.

DANC 489 Special Topics in Dance (1-3) Prerequisite: consent of the department chairman. Repeatable to a maximum of 6 credits provided subject matter is different.

DANC 499 Dance Workshop IV: Practicum (1-6) Prerequisite: permission of the department chairman. Advanced workshop in dance presentation, including performing, production and planned field experiences. Repeatable to a maximum of 6 credits.

DHCR — Human and Community Resources

DHCR 200 Introduction to Human Services (3) An interdisciplinary experience exploring the provision of human services in a variety of community and institutional settings. Lectures, seminars and observation and participation in campus, community and governmental service agencies.

DHCR 288 Special Topics in Human and Community Resources (1-3) Topics in interdisciplinary processes relevant to the study of human and community resources. Repeatable to a maximum of six credits when the subject matter is different and when there is no suffix.

DHCR 400 The Future of the Human Community (3) Examination of the future of our social and cultural institutions for education and child rearing, social and family relationships, health and leisure, information exchange, and the provision of food, clothing, and shelter.

DHCR 488 Selected Topics in Human and Community Resources (1-3) Topics in interdisciplinary processes relevant to the study of human and community resources. Repeatable to a maximum of six credits when the subject matter is different and when there is no suffix.

ECON — Economics

ECON 105 Economics of Social Problems (3) An introduction to modern economic and social problems,their nature, causes, and policy implications. Closed to students who have taken two of ECON 201, 203, OR 205.

ECON 201 Principles of Economics I (3) An introduction to the problems of unemployment, inflation, and economic growth. Emphasis is placed on the roles of monetary and fiscal policy in the conduct of macro-economic policy. The efficacy of wage and price controls is analyzed.

ECON 203 Principles of Economics II (3) This course emphasizes the behavior of individual consumers and business firms, problems of international trade and finance, the distribution of income, policies for eliminating poverty and discrimination, the problems of environmental pollution, and the impact of different market structures upon economic activity. (Students are advised to take ECON 201 before ECON 203.)

ECON 205 Fundamentals of Economics (3) (Not open to students who have credit in ECON 201. Credit will be given for either 201 OR 205, but not for both. Students in the College of Business and Management are required to take ECON 201.AND should not TAKE 205.) A one-semester introduction, for non-majors, to the principles of economics and their applications to the leading economic problems of society, including

inflation, unemployment, population, poverty, urban renewal, inequality, monopoly, environmental protection, international trade, imperialism, economic planning, and comparative economic systems

ECON 301 Current Issues in American Economic Policy (3) Prerequisite: ECON 201 OR 205. An analysis of current economic policy problems. Application of available facts and elementary techniques to the study of such policy problems as inflation, unemployment, taxation, population, income distribution, and welfare programs.

ECON 307 Development of Economic Ideas: Social Issues and Political Applications (3) Prerequisite: ECON 201 OR 205. The development of economic ideas with particular reference to their relationship with social history, contemporary politico-economic problems, underlying philosophies, view of the human prospect, methods of analysis, and the role of values. Marx, Marshall, Veblen, Schumpeter, Keynes, Samuelson, Friedman, Galbraith, Myrdal, Joan Robinson, and others. in

ECON 310 Evolution of Modern Capitalism in Western Europe and the United States (3) The evolution of the capitalist system from its medieval origins to the present. Emphasis on dynamic forces of cumulative change in capitalism, including capital accumulation, technology, expansion of markets, the corporate form of private property in the means of production, and the relation of capitalism to war and revolution.

ECON 311 American Economic Development (3) Prerequisite: ECON 201 AND 203, OR 205. An analysis of the major issues in the growth and development of the American economy. Basic economic theory related to such topics as agriculture, banking, industrialization, slavery, transportation, and the Depression of the 1930's.

ECON 316 Economic Development of Latin America (3) Prerequisite: ECON 201 AND 203, OR 205. Institutional characteristics of Latin America and an analysis of alternative strategies and policies for development.

ECON 317 Economic Development of South Asia and Sub-saharan Africa (3) Prerequisites: ECON 201 AND 203, OR 205 analysis of common themes and problems of national development in Southern Asia and Sub-Saharan Africa. Relations of economic patterns to society and politics. The record of achievement-planning and plans. Population, aid and investment, trade, and other topics.

ECON 355 Economics of Crime and Law Enforcement (3) Prerequisite: ECON 201 AND 203, OR 205. Economic analysis of crime and the criminal justice system, including such topics as the measurement of crime, economic models of crime, cost and benefits of police and prisons, private protection, gambling and other victimless crimes, and organized crime.

ECON 361 Economics of American Industries (3) Prerequisite: ECON 201 AND 203, OR 205. A survey of industrial organization theory. Analysis of the structure, conduct, performance, and public policies in selected American industries.

ECON 370 Labor Markets, Human Resources, and Trade Unions (3) Prerequisite: ECON 201 and ECON 203, or ECON 205. A survey of labor markets and the American labor movement. Analysis of labor force growth and composition, problems of unemployment and labor market operations, theories of wage determination, the wage-price spiral, collective bargaining, and governmental regulation of employment and labor relations. Credit will be given for only one course: ECON 370 or ECON 470.

ECON 374 Sex Roles in Economic Life (3) Prerequisite: ECON 201 AND 203, OR 205. Discrimination against women in the labor market, the division of labor in the home and the workplace by sex, "the child care industry", women in poverty

ECON 375 Economics of Poverty and Discrimination (3) Prerequisite - ECON 201 AND 203 OR 205. The causes of the persistance of low income groups, the relationship of poverty to technological change, to economic growth, and to education and training, economic results of discrimination, proposed remedies for poverty and discrimination

ECON 380 Comparative Economic Systems (3) Prerequisite: ECON 201 AND 203, OR 205. A comparative analysis of the theory and practice of various types of economic systems, with special attention being given to the economic systems of the United States, the Soviet Union, Main and China, Western and Eastern Europe, and lesser developed countries.

ECON 381 Environmental Economics (3) Prerequisite: ECON 201 OR 205 or consent of instructor. Application of economic theory to problems of enviromental quality and management. Theory of economic externalities, common property resources, alternative pollution control measures, and limits to economic growth.

ECON 385 Economics of Natural Resources (3) Prerequisite: ECON 205 OR 203. Economic analysis of natural resource problems, with special emphasis on the rate of use of exhaustible resources and the problems posed for the maintenance of growth.

ECON 396 Independent Honors Study (3) Normally taken in the senior year. Prerequisites: ECON 395 and candidacy for honors in economics. Integrated reading under staff direction. Leading to the preparation of a thesis in ECON 397.

ECON 397 Honors Thesis (3) Prerequisites: ECON 396 and candidacy for honors in economics. General supervision will be provided through assembled meetings with the professor in charge of the course.

ECON 398 Topics in Economics (3) This course is designed to meet the changing interests of students and staff. Topics vary in response to those interests. This course may be repeated for credit when the subject matter changes. Students are advised to seek information about the coverage and prerequisites during the registration period. Repeatable to a maximum of six hours.

ECON 399 Individual Reading and Research For Undergraduates (3) Prerequisite: six hours of upper-division economics courses. By arrangement with individual faculty members. This course is designed for students desiring specialized instruction and guidance in subjects not covered in the course offerings. Before enrollment, the student must secure agreement from an individual faculty member to act as his supervisor. A program of reading, research and evaluation will be worked out between the student and the faculty member. Repeatable to a maximum of six credits.

ECON 401 National Income Analysis (3) Prerequisite: ECON 201, 203. Required for economics majors. Analysis of the determination of national income, employment, and price levels. Discussion of consumption, investment, inflation, and government fiscal and monetary policy.

ECON 402 Business Cycles (3) First semester. Prerequisite: ECON 430. A study of the causes of depressions and unemployment, cyclical and secular instability, theories of business cycles, and the problem of controlling economic instability

ECON 403 Intermediate Price Theory (3) Prerequisite: ECON 201 203. Required for economics majors. An analysis of the theories of consumer behavior and of the firm and of general price and distribution theory, with applications to current economic issues.

ECON 405 Intermediate Macro-economic Theory (3) Prerequisite: ECON 201, 203 and MATH 220 or its equivalent. Analysis of determination of national income, employment, prices, and growth. Major sectors of economy, models of their interaction, fiscal and monetary policy inflation. Especially recommended for economics majors and those with analytic backgrounds. Credit will be given for only one course, ECON 401 or ECON 405

ECON 406 Intermediate Micro-economic Theory (3) Prerequisite: ECON 201 203 and MATH 220 or its equivalent. Theory of prices and markets. Analysis of the theory of the household and of the firm. concepts of general equilibrium, and welfare economics. Especially recommended for economics majors and those with analytic backgrounds. Credit will be given for only one course. ECON 403 or ECON 406

ECON 407 Contemporary Economic Thought (3) Prerequisites: ECON 201 203 and senior standing. Graduate students should take ECON 705. A survey of the development of economic thought since 1900 with special reference to Thorstein Veblen and other pre-1939 institutionalists and to post-1945 neo-institutionalist s such as J.K. Galbraith and Gunnar Myrdal.

ECON 415 Introduction to Economic Development of Underdeveloped Areas (3) Prerequisite: ECON 201 AND 203, OR 205. An analysis of the economic and social characteristics of underdeveloped areas. Recent theories of economic development, obstacles to development, policies and planning for development.

ECON 418 Economic Development of Selected Areas (3) Prerequisite: ECON 415. Institutional characteristics of a specific area are discussed and alternate strategies and policies for development are analyzed

ECON 421 Economic Statistics (3) Prerequisite: MATH 110 or equivalent. Not open to students who have taken BMGT 230 or BMGT 231. An introduction to the use of statistics in economics. Topics include probability, random variables and their distributions, sampling theory, estimation, hypothesis testing, analysis of variance, regression analysis, correlation.

ECON 422 Quantitative Methods in Economics (3) Prerequisites: ECON 201, 203, AND 421 (or BMGT 230); or permission of instructor. Emphasizes the interaction between the economic problems posed by economists and the assumptions employed in statistical theory. Deals with the formulation, estimation and testing of economic models. Topics include single variable and multiple variable regression techniques, theory of identification, autocorrelation and simultaneous equations. Independent work relating the material in the course to an economic problem chosen by the student is required

ECON 425 Mathematical Economics (3) Prerequisites: ECON 401 AND 403 and one year of college mathematics. A course designed to enable economics majors to understand the simpler aspects of mathematical economics. Those parts of the calculus and algebra required for economic analysis will be presented.

ECON 430 Money and Banking (3) Prerequisite: ECON 201 and ECON 203. The structure of financial institutions and their role in the provision of money and near money. Analysis of the Federal Reserve System, the techniques of central banks, and the control of supply of financial assets in stabilization policy. Relationship of money and credit to economic activity and the price level. Credit will be given for only one course: ECON 430 or ECON 431

ECON 431 Theory of Money, Prices and Economic Activity (3) Prerequisite: ECON 401 or ECON 405. Monetary theory and the role of money, financial institutions and interest rates in macro models. Analysis of money demand and supply and of the Monetarist-Keynesian debate as they affect inflation and stabilization policy. Credit will be given for only one course: ECON 430 or ECON 431

ECON 440 International Economics (3) Prerequisite: ECON 201 and ECON 203. A description of international trade and the analysis of international transactions, exchange rates and balance of payments. Analysis of policies of protection, devaluation, and exchange rate stabilization and their consequences. Credit will be given for only one course: ECON 440 or ECON 441.

ECON 441 Theory of International Economics (3) Prerequisite: ECON 401 or ECON 405 and ECON 403 or ECON 406. Theoretical treatment of international trade and international finance. Includes Ricardian and Heckscher-Ohlin theories of comparative advantage, analysis of tariffs and other trade barriers, international factor mobility, balance of payments adjustments, exchange rate determination, and fiscal and monetary policy in an open economy. Credit will be given for only one course: ECON 440 or ECON 441

ECON 450 Introduction to Public Sector Economics (3) Prerequisite: ECON 201 and ECON 203 or ECON 205. The role of federal, state and local governments in meeting public wants. Analysis of theories of taxation, public expenditures, government budgeting, benefit-cost analysis and income redistribution and their policy applications. Credit will be given for only one course: ECON 450 or ECON 454

ECON 451 Public Choice and Public Policy (3) Prerequisite: ECON 201, 203, OR 205. Analysis of collective decision making, economic models of government, program budgeting, and policy implementation, emphasis on models of public choice and institutions which affect decision making

ECON 454 Theory of Public Finance and Fiscal Federalism (3) Prerequisite: ECON 403 or ECON 406. Study of welfare economics and the theory of public goods, taxation, public expenditures, benefit-cost analysis, and state and local finance. Applications of theory to current policy issues. Credit will be given for only one course: ECON 450 or ECON 454.

ECON 460 Industrial Organization (3) Prerequisite: ECON 403 and 406. Changing structure of the American economy, price policies in different industrial classifications of monopoly and competition in relation to problems of public policy.

ECON 465 Health Care Economics (3) Prerequisite: ECON 203 or ECON 205. Analysis of the health care, the organization of its delivery and financing. Access to care, the role of insurance, regulation of hospitals, physicians, and the drug industry, role of technology, and limits on health care spending.

ECON 470 Theory of Labor Economics (3) Prerequisite: ECON 403 or ECON 406. An analytical treatment of theories of labor markets. The theory of human capital and allocation of time in household labor supply models; marginal productivity theory of labor demand; market structure and the efficiency of labor markets; information theory and screening; discrimination; distribution of income; and unemployment. Credit will be given for only one course: ECON 370 or ECON 470.

ECON 471 Current Problems in Labor Economics (3) Prerequisite: ECON 470. For students who wish to pursue, in depth, selected topics in the labor field. Issues and topics selected for detailed examination may include manpower training and development, unemployment compensation and social security, race and sex discrimination in employment, wage theory, productivity analysis, the problems of collective bargaining in public employment, wage-price controls and incomes policy.

ECON 482 Economics of the Soviet Union (3) Prerequisite: ECON 201 AND 203, OR 205. An analysis of the organization, operating principles and performance of the Soviet economy with attention to the historical and ideological background, planning, resources, industry, agriculture, domestic and foreign trade, finance, labor, and the structure and growth of national income.

ECON 484 The Economy of China (3) Prerequisite: ECON 201 AND 203, OR 205. Policies and performances of the Chinese economy since 1949. Will begin with a survey of modern China's economic history. Emphasizes the strategies and institutional innovations that the Chinese have adopted to overcome the problems of economic development. Some economic controversies raised during the "Cultural Revolution" will be covered in review of the problems and prospects of the present Chinese economy.

ECON 486 The Economics of National Planning (3) Prerequisite: ECON 201 AND 203, OR 205. An analysis of the principles and practice of economic planning with special reference to the planning problems of West European countries and the United States.

ECON 490 Survey of Urban Economic Problems and Policies (3) Prerequisites: ECON 201 AND 203, OR 205. An introduction to the study of urban economics through the examination of current policy issues. Topics may include suburbanization of jobs and residences, housing and urban renewal, urban transportation, development of new towns, ghetto economic development, problems in services such as education and police.

ECON 491 Economics and Control of Urban Growth (3) Prerequisite: ECON 490. An analysis of metropolitan development processes, the consequences of alternative growth patterns, and the evaluation of policies to control growth.

ECON 492 Economics of Location and Regional Growth (3) Prerequisite: ECON 403, or consent of instructor. Study of the theories, problems, and policies of regional economic development and the location of economic activity for both rural and metropolitan regions. Methods of regional analysis.

EDCI — Curriculum and Instruction

EDCI 280 School Service Semester (3) One hour per week on campus with an arranged six hours each week in schools. Development of conceptual understanding of the teaching-learning process. Seminar to coordinate on- and off- campus experiences.

EDCI 288 Special Topics in Teacher Education (1-3) Prerequisite: major in Curriculum and Instruction or consent of department. May be repeated to a maximum of six credits when topic is different.

EDCI 298 Special Problems in Teacher Education (1-6) Prerequisite: consent of advisor. Available only to freshmen and sophomore Curriculum and Instruction majors who have definite plans for individual study of approved problems relative to their preparation for teaching. Credit according to extent of work.

EDCI 300 Curriculum and Instruction in Art Education (3) Prerequisites: EDHD 300 and EDCI 390, or consent of instructor. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and other topics pertinent to art education.

EDCI 301 Teaching Art in the Elementary School (3) Limited to non-art education majors. Art methods and materials for elementary schools. Includes laboratory experiences with materials appropriate for elementary schools. Emphasis on emerging areas of art education for the elementary classroom teacher.

EDCI 302 Curriculum and Instruction in Secondary Education: Music (3) Prerequisite: EDHD 300 and EDCI 390. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and topics pertinent to music education.

EDCI 310 Curriculum and Instruction: Pre-school (3) Curriculum of early childhood education in relation to developmental needs of various age levels, emphasis on the activities, materials and methods by which educational objectives are attained.

EDCI 311 Curriculum and Instruction: Early Childhood (K-3) (3) Curriculum of early childhood education with special emphasis on cognitive and affective dimensions of the young child.

EDCI 313 Creative Activities and Materials for the Young Child (3) Prerequisites: EDCI 280. Corequisites: EDHD 300, MUED 450, EDCI 318 and EDCI314. Techniques and resources for art, music, play and creative dramatics.

EDCI 314 Teaching Language, Reading, Drama and Literature with Young Children (3) Prerequisite: EDCI 280. Corequisites: EDHD 300, MUED 450, EDCI 318 and EDCI 313. Introduction to the teaching of reading in the context of the language arts, beginning reading instruction and utilization of literature, drama, and writing.

EDCI 315 The Young Child in the Social Environment (3) Prerequisites: EDCI 313 and EDCI 314. Corequisites: EDCI 316, 317, and 318. The child's understanding of people, social roles, society and various cultures; communicative skills and ability to develop satisfying relationships with peers and adults. Related techniques, materials and resources included.

EDCI 316 The Teaching of Reading: Early Childhood (3) Prerequisites: EDCI 313 and EDCI 314. Corequisites: EDCI 315, 317, and 318. The fundamentals of developmental reading instruction, including reading readiness, use of experience records, procedures in using basal readers, the improvement of comprehension, teaching reading in all areas of the curriculum, uses of children's literature, the program in word analysis, and diagnostic techniques.

EDCI 317 The Young Child and the Physical Environment (3) Prerequisites: EDCI 313 and EDCI 314. Corequisites: EDCI 315, 316, and 318. Teaching skills, and background knowledge important to guiding the child in learning how to learn about the physical environment. The skills of quantification, observation, inference, space-time relationships, and classification.

EDCI 318 Professional Development Seminar in Early Childhood Education (1-2) Affective and integrative functions of teaching young children; planning daily programs, organizing the learning environment, developing the curriculum, clarifying values, guiding behavior, diagnosing and evaluating, and working with parents and other adults. Repeatable for a total of three semester hours.

EDCI 320 Curriculum and Instruction in Secondary Education: Social Studies (3) Prerequisite: EDHD 300 and EDCI 390. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement and topics pertinent to social studies education. Includes emphasis on multi-cultural education.

EDCI 321 Curriculum and Instruction in Secondary Education: Geography (3) Prerequisites: EDHD 300 and EDCI 390. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and topics pertinent to geography education.

EDCI 322 Curriculum and Instruction in Elementary Education - Social Studies (3) Prerequisites: EDCI 280 and EDHD 300. Curriculum, organization and methods of teaching, evaluation of materials, and utilization of environmental resources. Emphasis on multicultural education. Includes laboratory/field experiences.

EDCI 330 Curriculum and Instruction in Secondary Education: Foreign Language (3) Prerequisite: EDHD 300 and EDCI 390. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks, and other instructional materials, measurement, and other topics pertinent to foreign language education.

EDCI 340 Curriculum and Instruction in Secondary Education: English/Speech/Drama (3) Prerequisites: EDHD 300 and EDCI 390. Objectives, selection, and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and other topics pertinent to English, speech, drama education.

EDCI 342 Curriculum and Instruction in Elementary Education: Language Arts (3) Prerequisite: EDCI 280 and EDHD 300. Listening, oral communication, functional writing, creative writing, spelling, handwriting, and creative expression. Includes laboratory/field experiences.

EDCI 350 Curriculum and Instruction in Secondary Education: Mathematics (3) Prerequisite: EDHD 300 and EDCI 390. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and topics pertinent to mathematics education.

EDCI 352 Curriculum and Instruction in Elementary Education: Mathematics (3) Prerequisites: MATH 210, EDCI 280, and EDHD 300. Materials and procedures to help children sense arithmetical meanings and relationships. Development of an understanding of the number system and arithmetical processes. Includes laboratory/field experiences.

EDCI 362 Curriculum and Instruction in Elementary Education: Reading (3) Prerequisites: EDCI 280 and EDHD 300. The fundamentals of developmental reading instruction, including reading readiness, use of experience stories, procedures in using basal readers, the improvement of comprehension, word analysis, and procedures for determining individual needs. Includes laboratory/field experiences.

EDCI 370 Curriculum and Instruction in Secondary Education: Science (3) Prerequisite: EDHD 300 and EDCI 390. For pre-service science teachers. The study of the teacher's role in secondary school science instruction: preparing objectives, planning lessons, selecting and organizing for classroom and laboratory instruction, determining appropriate teaching methods, selecting textbooks, other instructional materials and measuring and evaluating student achievement. Includes laboratory and field experiences.

EDCI 372 Curriculum and Instruction in Elementary Education: Science (3) Prerequisites: EDCI 280 and EDHD 300. Objectives, methods, materials and activities for teaching science in the elementary school; emphasis on teaching strategies which help children learn the processes and concepts of science. Includes laboratory/field experiences.

EDCI 380 Curriculum and Instruction: Elementary (3) Curriculum of elementary education. Developmental needs at various age levels, with emphasis upon the activities, materials and methods by which educational objectives are attained.

EDCI 381 Schools and Children (3) Methods of educating children. Examination of different roles of parents and other community members as consumers and participants in schools. Not open for credit to students in teacher preparation programs.

EDCI 383 Curriculum and Instruction in Secondary Education: Dance (3) Prerequisites: EDHD 300 and EDCI 390. Objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and other topics pertinent to dance.

EDCI 390 Principles and Methods of Secondary Education (3) Prerequisite: EDHD 300 or consent of instructor. Principles and methods of teaching in junior and senior high schools. Instructional problems common to all of the subject fields, considered in relation to the needs and interests of youth, the urgent social problems of today, and the central values of society.

EDCI 401 Student Teaching in Elementary School: Art (4-8) Limited to art education majors who have consent of department. Fulfils elementary teaching requirements in K-12 art education program.

EDCI 402 Student Teaching in Secondary Schools: Art (2-8) Prerequisite: EDCI 300.

EDCI 403 Teaching of Art Criticism in Public Schools (3) Introduction to theories of art criticism as related to teaching of art. Trips to galleries and museums. Open to fine arts majors and students from other disciplines.

EDCI 406 Practicum in Art Education: Two-Dimensional (3) Theory and practical experience in two-dimensional design in various art media; development of teaching procedures and presentation of materials in school settings.

EDCI 407 Practicum in Art Education: Three-Dimensional (3) A lecture-studio course to develop skills, material resources, and educational strategies for three-dimensional projects in school settings.

EDCI 410 The Child and the Curriculum: Early Childhood (3) Relationship of the school curriculum, nursery school through grade 3, to child growth and development. Recent trends in curriculum organization; the effect of environment on learning, readiness to learn; and adapting curriculum content and methods to maturity levels of children. Primarily for in-service teachers, nursery school through grade 3.

EDCI 411 Student Teaching: Preschool (4) Prerequisite: completion of required methods courses and consent of the department.

EDCI 412 Student Teaching: Kindergarten (4) Prerequisite: completion of required methods courses and consent of department.

EDCI 413 Student Teaching: Primary Grades (8) Prerequisite: completion of required methods courses and consent of department.

EDCI 416 Mainstreaming in Early Childhood Educational Settings (3) Theoretical bases and applied practices for integrating handicapped children into regular early childhood programs.

EDCI 420 Student Teaching Seminar in Secondary Education: Social Studies (3) Corequisite: EDCI 421. An analysis of teaching theory, strategies, and techiques in relation to the student teaching experience.

EDCI 421 Student Teaching in Secondary Schools: Social Studies (12) Prerequisite: EDCI 320.

EDCI 422 Student Teaching in Secondary Schools: Geography (12) Prerequisite: EDCI 321.

EDCI 423 Social Studies in Early Childhood Education (3) Curriculum, organization and methods of teaching; evaluation of materials and utilization of environmental resources. Emphasis on multicultural education. Primarily for in-service teachers, nursery school through grade 3.

EDCI 424 Social Studies in the Elementary School (3) Curriculum, organization and methods of teaching; evaluation of materials and utilization of environmental resources. Emphasis on multicultural education. Primarily for in-service teachers, grades 1-6.

EDCI 425 Social Studies and Multicultural Education (3) Seminar relating to general social science principals that are applicable to multicultural education as a component of social studies instruction. Cultural experiences arranged on an independent basis for each participant.

EDCI 426 Methods of Teaching Social Studies in Secondary Schools (3) Prerequisite: EDHD 300 and EDCI 390, or consent of instructor. The objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement and topics pertinent to social studies education. For in-service teachers. Includes emphasis on multicultural education.

EDCI 430 Student Teaching Seminar in Secondary Education: Foreign Language (3) Co-requisite: EDCI 431. An analysis of teaching theory, strategies and techniques in relation to the student teaching experience.

EDCI 431 Student Teaching in Secondary Schools: Foreign Languages (12) Prerequisite: EDCI 330.

EDCI 432 Foreign Language Methods in the Elementary School (3) Prerequisite: consent of instructor. Methods and techniques for developmental approach to the teaching of modern foreign languages in elementary schools. Development of oral-aural skills in language development.

EDCI 433 Teaching the Audio-Lingual Skills in Foreign Languages (3) Prerequisite: EDHD 300 and EDCI 390, or consent of instructor. The objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement and topics pertinent to foreign language education. For in-service teachers.

EDCI 434 Methods of Teaching English to Speakers of other Languages (3) An introductory course in methods for teaching listening, speaking, reading and writing techniques and a review of research findings.

EDCI 435 Teaching Reading in a Second Language (3) Prerequisite: consent of instructor. Analysis of selected theories and practices in first language reading applied to second language teaching/learning, diagnostic and prescriptive techniques and analysis of the student's cultural background as a factor in evaluating reading achievement in the second language.

EDCI 436 Teaching for Multicultural Understanding (3) The techniques and content for teaching culture in foreign language classes and English as a Second Language (ESL) classes. Research and evaluation of selected aspects of a culture as basis for creating teaching materials.

EDCI 437 Bilingual-Bicultural Education (3) Analysis of bilingual-bicultural education in the U.S. and abroad with emphasis on TESOL. Methods of teaching, goals, instructional materials and mainstreaming of bilingual students.

EDCI 438 Field Experience in TESOL (3) Prerequisite: EDCI 434 or equivalent, and consent of instructor. Systematic observations, tutoring and teaching in a TESOL field setting.

EDCI 440 Student Teaching Seminar in Secondary Education: English, Speech, Drama (1) Corequisite: EDCI 441. An analysis of teaching theory, strategies and techniques in relation to the student teaching experience.

EDCI 441 Student Teaching in Secondary Schools: English (12) Prerequisite: EDCI 340.

EDCI 442 Student Teaching in Secondary Schools: Speech (12) Prerequisite: EDCI 340.

EDCI 443 Literature for Children and Youth (3) Analysis of literary materials for children and youth. Timeless and ageless books, and outstanding examples of contemporary publishing. Evaluation of the contributions of individual authors, illustrators and children's book awards.

EDCI 444 Language Arts in Early Childhood Education (3) Teaching of spelling, handwriting, oral and written expression and creative expression. Primarily for in-service teachers, nursery school through grade 3.

EDCI 445 Language Arts in the Elementary School (3) Teaching of spelling, handwriting, oral and written expression and creative expression. Primarily for in-service teachers, grades 1-6.

EDCI 446 Methods of Teaching English, Speech, Drama in Secondary Schools (3) Prerequisite: EDHD 300 and EDCI 390, or consent of instructor. The objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks, and other instructional materials, measurement and topics pertinent to english, speech, and drama education. For in-service teachers.

EDCI 447 Field Experience in English, Speech, Drama Teaching (1) Corequisite: EDCI 340. Practical experience as an aide to a regular english, speech or drama teacher, assigned responsibilities and participation in a variety of teaching/learning activities.

EDCI 450 Student Teaching Seminar in Secondary Education: Mathematics (3) Corequisite: EDCI 451. An analysis of teaching theory, strategies, and techniques in relation to the student teaching experience.

EDCI 451 Student Teaching in Secondary Schools: Mathematics (12) Prerequisite: EDCI 350.

EDCI 452 Mathematics in Early Childhood Education (3) Prerequisite: MATH 210 or equivalent. Emphasis on materials and procedures which help pupils sense arithmetic meanings and relationships. Primarily for in-service teachers, nursery school through grade 3.

EDCI 453 Mathematics in the Elementary School (3) Prerequisite: MATH 210 or equivalent. Emphasis on materials and procedures which help pupils sense arithmetic meanings and relationships. Primarily for in-service teachers, grades 1-6.

EDCI 454 The Mathematics Laboratory (3) Prerequisite: EDCI 352 or equivalent, or consent of the instructor. The definition, design, and uses of an elementary school mathematics laboratory. Laboratory visitations. The design of instructional activities and field-test activities with children.

EDCI 455 Methods of Teaching Mathematics in Secondary Schools (3) Prerequisite: EDHD 300 and EDCI 390, or consent of instructor. The objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement and topics pertinent to mathematics education. For in-service teachers.

EDCI 456 Diagnosis of Learning Disabilities in Mathematics (3) Prerequisites: all courses in the EDSP 330 block and MATH 210 or consent of the instructor. Development of skills in diagnosing and identifying learning disabilities in mathematics and in planning for individualized instruction. Clinic participation required.

EDCI 461 Reading in Early Childhood Education (3) Fundamentals of developmental reading instruction, including reading readiness, use of experience stories, procedures in using basal readers, the improvement of comprehension, word analysis, and procedures for determining individual needs. Primarily for in-service teachers, nursery school through grade 3.

EDCI 462 Reading in the Elementary School (3) Fundamentals of developmental reading instruction, including reading readiness, use of experience stories, procedures in using basal readers, the improvement of comprehension, word analysis, and procedures for determining individual needs. Primarily for in-service teachers, grades 1-8.

EDCI 463 The Teaching of Reading in the Secondary School (3) The fundamentals of secondary reading instruction, including emphasis on content reading instruction.

EDCI 464 Clinical Practices in Reading Diagnosis and Instruction (3) Prerequisite: EDCI 362 or 463. A laboratory course in which each student has one or more pupils for analysis and instruction. At least one class meeting per week to diagnose individual cases and to plan instruction.

EDCI 466 Literature for Adolescents (3) Reading and analysis of fiction and nonfiction, methods for critically assessing quality and appeal; current theory and methods of instruction; research on response to literature; curriculum design and selection of books.

EDCI 467 Teaching Writing (3) Sources and procedures for developing curriculum objectives and materials for teaching written composition: prewriting, composing, and revision procedures, contemporary

directions in rhetorical theory; survey of research on composition instruction.

EDCI 471 Student Teaching in Secondary Schools: Science (12) Prerequisite: EDCI 352

EDCI 472 Methods of Teaching Science in Secondary Schools (3) Prerequisites: EDHD 300, EDCI390, and consent of instructor. The study of the teachers role in secondary school science instruction: preparing objectives, planning lessons, selecting and organizing for classroom and laboratory instruction, determining appropriate teaching methods, selecting textbooks and other instructional materials, measuring and evaluating student achievement. Includes lab and field experience. For in-service teachers.

EDCI 473 Environmental Education (3) Two lecture-discussion periods and one three hour laboratory-field experience session per week. An interdisciplinary course covering the literature, techniques and strategies of environmental education. Emphasis on the study of environmental education programs and the development of a specific program which is designed to implement the solution of an environmental problem. The laboratory-field experience is provided as a model for future activities of students. [Open to any student who wishes to become actively involved in the process of environmental education program development.]

EDCI 474 Science in Early Childhood Education (3) Objectives, methods, materials and activities for teaching science in the elementary school. Primarily for in-service teachers, nursery school through grade 3.

EDCI 475 Science in the Elementary School (3) Objectives, methods, materials, and activities for teaching science in the elementary school. Primarily for in-service teachers, grades 1-6.

EDCI 476 Teaching Ecology and Natural History (3) An introduction to the teaching of natural history in the classroom and in the field. Ecological principles; resources and instructional materials; curricular materials. Primarily for teachers, park naturalists, and outdoor educators.

EDCI 480 The Child and the Curriculum: Elementary (3) Relationship of the school curriculum, grades 1-6, to child growth and development. Recent trends in curriculum organization; the effect of environment on learning, readiness to learn; and adapting curriculum content and methods to maturity levels of children. Primarily for in-service teachers, grades 1-6.

EDCI 481 Student Teaching: Elementary (12) Prerequisite: completion of required methods courses and consent of department.

EDCI 482 Student Teaching in Elementary School: Special Education (8) Prerequisite: completion of required methods courses and consent of department. Limited to special education majors who have previously applied. Provides 8 weeks of full-time experience in the regular elementary classroom.

EDCI 483 Student Teaching in School Media Centers: Elementary (6) Prerequisites: EDHD 300, EDCI 480, or consent of instructor. Supervised internship experience in elementary and middle school media centers. Participation at a professional level in the management and operation of an on-going media program.

EDCI 484 Student Teaching in Elementary School: Music (4-6) Limited to MUED majors who have consent of department. Fulfills elementary teaching requirements in K-12 music education programs.

EDCI 485 Student Teaching in Elementary School: Physical Education (4-8) Limited to PHED majors who have consent of the department. Fulfills elementary teaching requirements in K-12 physical education programs.

EDCI 486 Supervision of Student Teachers (3) Designed for in-service teachers. The development and refinement of skills in observing, evaluating and conducting conferences with student teachers. Clinical supervision and cooperative problem solving. Required by some school systems for supervision of student teachers.

EDCI 487 Introduction to Computers in Instructional Settings (3) Prerequisite: at least six hours in education or instructional experience. A first-level survey course for students interested in the possibilities of using computers for instructional purposes. "Hands-on" experience with computers. Site visits, guest speakers, and individual project opportunities.

EDCI 488 Selected Topics in Teacher Education (1-3) Prerequisite: Major in curriculum and instruction, or consent of department. May be repeated to a maximum of six credits when topic is different.

EDCI 489 Field Experiences in Education (1-4) Prerequisite: Consent of department. Planned field experience in education-related activities. Credit not to be granted for experiences accrued prior to registration.

EDCI 490 Curriculum and Instruction in the Middle and Junior High School (3) Curriculum and Instruction in the middle and junior high school. Purposes, functions and characteristics of this school unit, a study of its population, organization, program of studies, methods, staff, and other topics together with implications for prospective teachers.

EDCI 491 Student Teaching in Secondary Schools: Health (12) Prerequisite: consent of instructor.

EDCI 492 Student Teaching in Secondary Schools: Dance (2-8) Prerequisite: EDCI 383.

EDCI 493 Student Teaching in School Media Centers: Secondary (6) Prerequisite: EDHD 300 or consent of instructor. Supervised internship experience in secondary school media centers. Participation at a professional level in the management and operation of an on going media program.

EDCI 494 Student Teaching in Secondary Schools: Music (2-8) Prerequisite: consent of instructor.

EDCI 495 Student Teaching in Secondary Schools: Physical Education (2-8) Prerequisite: consent of instructor.

EDCI 496 Student Teaching Seminar in Library Media Services (3) An analysis of thhery, strategies, and techniques in relation to the student teaching experience.

EDCI 498 Special Problems in Teacher Education (1-6) Prerequisite: Consent of advisor. Available only to curriculum and instruction majors who have definite plans for individual study of approved problems. Credit according to extent of work.

EDCI 499 Workshops, Clinics, and Institutes (1-6) The maximum number of credits that may be earned under this course symbol toward any degree is six semester hours; the symbol may be used two or more times until six semester hours have been reached. The following types of educational enterprise may be scheduled under this course heading: workshops conducted by the College of Education (or developed cooperatively with other colleges and universities) and not otherwise covered in the present course listing; clinical experiences in pupil-testing centers, reading clinics, speech therapy laboratories, and special education centers; institutes developed around specific topics or problems and intended for designated groups such as school superintendents, principals and supervisors.

EDCP — Education Counseling and Personnel Services

EDCP 108 College Aims (1) This course is primarily aimed at orienting new students toward the practice of efficient study techniques. It will be concerned with such topics as: how to study and develop higher level work skills, diagnosing and remedying skill disabilities; handling problem area which distracts students from their studies.

EDCP 310 Peer Counseling Theory and Skills (3) The theories and skills of peer helping relationships. Counseling theories and skills at a level appropriate for students seeking basic level training for use in peer counseling settings.

EDCP 410 Introduction to Counseling and Personnel Services (3) Presents principles and procedures, and examines the function of counselors, psychologists in schools, school social workers, and other personnel service workers.

EDCP 411 Mental Hygiene (3) The practical application of the principles of mental hygiene to classroom problems.

EDCP 413 Behavior Modification (3) Knowledge and techniques of intervention in a variety of social situations, including contingency contracting and time out will be acquired.

EDCP 414 Principles of Behavior (3) Development of student proficiency in analyzing complex patterns of behavior on the basis of empirical evidence.

EDCP 415 Behavior Mediation (3) Prerequisite: EDCP 414. Basic principles of human behavior will be reviewed and application of these principles will be implemented under supervision.

EDCP 417 Group Dynamics and Leadership (3) Two hours of lecture discussion and two hours of laboratory per week. The nature and property of groups, interaction analysis, developmental phases, leadership dynamics and styles, roles of members and interpersonal communications. Laboratory involves experimental based learning.

EDCP 420 Education and Racism (3) Strategy development for counselors and educators to deal with problems of racism.

EDCP 460 Introduction to Rehabilitation Counseling (3) Introductory course for majors in rehabilitation counseling, social work, psychology, or education who desire to work professionally with physically or emotionally handicapped persons.

EDCP 461 Psycho-Social Aspects of Disability (3) Theory and research concerning disability, with emphasis on crisis theory, loss and mourning, handicapped as a deviant group, sexuality and functional loss, attitude formation, dying process and coping. Implications for counseling and the rehabilitation process.

EDCP 470 Introduction to Student Personnel (3) Prerequisite: consent of instructor. A systematic analysis of research and theoretical literature on a variety of major problems in the organization and administration of student personnel services in higher education. Included will be discussion of such topics as the student personnel philosophy in education, counseling services, discipline, housing, student activities, financial aid, health, remedial services, etc.

EDCP 489 Field Experiences in Counseling and Personnel Services (1-4) Prerequisite: Consent of department. Planned field experience in education-related activities. Credit not to be granted for experiences accrued prior to registration.

EDCP 498 Special Problems in Counseling and Personnel Services (1-3) Prerequisite: consent of instructor. Available only to major students who have formal plans for individual study of approved problems.

EDCP 499 Workshops, Clinics, Institutes (1-6) The maximum number of credits that may be earned under this course symbol toward any degree is six semester hours; the symbol may be used two or more times until six semester hours have been reached. The following type of educational enterprise may be scheduled under this course heading: workshops conducted by the Department of Counseling and Personnel Services (or developed cooperatively with other departments, colleges and universities) and not otherwise covered in the present course listing; clinical experiences in counseling and testing centers, reading clinics, speech therapy laboratories, and special education centers; institutes developed around specific topics or problems and intended for designated groups.

EDHD — Education, Human Development

EDHD 300 Human Development and Learning (6) Open only to students approved for teacher education. Studies scientific facts that describe growth, development, and learning and the implications of these for the teacher and the school. A study of an individual child and a classroom participation experience are integral parts of the course and require a one-half day per week assignment in a public school as a teacher aide. Students are scheduled for field assignments in an elementary or high school according to the curriculum they are in. Each group is under the supervision of a faculty member with whom it meets every second week in a seminar session.

EDHD 306 A Study of Human Behavior (3) This course is planned for and limited to students who are not enrolled in the College of Education, and it does not satisfy the requirements of the professional teacher education programs. The course is designed to

introduce students to the scientific principles (physical, social and psychological) which describe human behavior, development and adjustment at all maturity levels and to use these principles in the study of individual children and youth. Each student will observe, record, and analyze the behavior of an individual throughout the semester and must have one half-day a week for this purpose.

EDHD 319 Scientific Concepts in Human Development (3) Concepts and issues in contemporary culture in relation to the development and learning of children and youth. Repeatable for a maximum of 6 credits if the topics differ.

EDHD 320 Human Development Through the Lifespan (3) Central concepts related to parameters of human development, individual and social, which arise throughout the various stages of the lifespan. Continuity and change within the developing individual.

EDHD 330 Human Development and Societal Institutions (3) Development of the individual in the context of his relationships with the formal and informal institutions of society. An examination of various aspects of development, from the broad perspective of the social sciences.

EDHD 340 Human Development Aspects of the Helping Relationship (3) Focuses upon the development of skills in relating , communicating, and problem-solving with others. Includes an examination of psychological theories relevant to the helping relationship, laboratory experiences in developing communication skills, and field experiences wherein theory and skills are applied.

EDHD 350 Human Development Factors in Personal Development (3) An exploration of personality dynamics including self-study experiences which contribute to the student's personal growth and self-insight. Designed for the preprofessional, with emphasis on factors which enhance optimal development in small group interaction.

EDHD 400 Introduction to Gerontology (3) An overview of the processes of aging including physiological, sociological, and psychological aspects as an introduction to the field of gerontology. Analysis of physiological changes, cultural forces and self processes that have a bearing on life quality in the late years. Examination of community action in response to problems of the elderly. Direct field contact with programs for the elderly.

EDHD 411 Child Growth and Development (3) Growth and development of the child from conception through the early childhood years, with emphasis on development sequences in physical, psychological and social areas. Implications for understanding and working with young children in the home, school, and other settings.

EDHD 413 Adolescent Development (3) A study of the interplay of physical, cultural and self forces as they influence behavior, development, learning and adjustment during adolescence. Includes observation and case study. This course cannot be used to meet the psychological foundations requirements for teacher certification.

EDHD 416 Scientific Concepts in Human Development III (3) Guided reading and observation of pupils throughout the school year. Emphasis on human development concepts relating to impact of family, school, society, and peer group on the student. Collection and analysis of data affecting learning and behavior.

EDHD 417 Laboratory in Behavior Analysis III (3) Prerequisite: EDHD 416. Guided reading and observation of pupils throughout the school year. Emphasis on analysis of intrinsic aspects of learning and behavior including cognitive processes, motivation, self-concept, attitudes, and values.

EDHD 419 Human Development and Learning in School Settings (3) Prerequisite: classroom teaching experience or consent of instructor. Advanced study of human development and learning principles in the continuous study and evaluation of several different phases of the school program over an extended period of time. Repeatable for a maximum of 6 credits if the topics differ.

EDHD 445 Guidance of Young Children (3) Prerequisite: PSYC 100, EDHD 300, EDHD 306 or equivalent. Development of an appreciation and understanding of young children from differing home and community backgrounds; study of individual and group problems.

EDHD 460 Educational Psychology (3) Prerequisites: PSYC 100 or EDUC 300 or equivalent. Offers an examination of research and problems in educational psychology. Includes consideration of measurement and the significance of individual differences, learning, motivation and emotions, transfer of learning, intelligence, attitudes, problem solving, understanding, thinking, and communicating knowledge. The course is intended to provide an overview of educational psychology with an emphasis on learning processes. It may not be substituted for EDUC 300 by regularly matriculated students in the teacher education program.

EDHD 489 Field Experiences in Education (1-4) Prerequisite: Consent of department. Planned field experience in education-related activities. Credit not to be granted for experiences accrued prior to registration.

EDHD 498 Special Problems in Education (1-3) Prerequisite: consent of instructor. Available only to mature students who have definite plans for individual study of approved problems.

EDHD 499 Workshops, Clinics, and Institutes (1-6) The maximum number of credits that may be earned under this course symbol toward any degree is six semester hours; the symbol may be used two or more times until six semester hours have been reached. The following type of educational enterprise may be scheduled under this course heading: workshops conducted by the College of Education (or developed cooperatively with other colleges and universities) and not otherwise covered in the present course listing, clinical experiences in pupil-testing centers, reading clinics, speech therapy laboratories, and special education centers, institutes developed around specific topics or problems and intended for designated groups such as school superintendents, principals and supervisors.

EDIT — Industrial, Technological and Occupational Education

EDIT 101 Mechanical Drawing I (2) Four hours of laboratory per week. An introduction to orthographic multi-view and isometric projection. Emphasis on the visualization of an object when it is represented by a multi-view drawing and on the making of multi-view drawings. Auxiliary views, sectional views, dimensioning, conventional representation and single stroke letters.

EDIT 102 Fundamentals of Woodworking (3) Two hours of lecture and four hours of laboratory per week. An orientation into the woodworking industry with regard to materials, products and processes while providing skill development in the care and use of hand and power tools.

EDIT 106 Teaching Creative Construction Activities I (3) Introduction to ceramics, graphics, metals and woods as construction activity materials utilized by multi-age groups in a variety of settings.

EDIT 110 Teaching Creative Construction Activities II (3) Four hours of laboratory per week. Prerequisite: EDIT 106. A continuation of EDIT 106. Study of basic phenomena of industry. Particularly those which apply to the manufacture of common products, housing, transportation and communication.

EDIT 112 Technical Calculations (3) The development of an understanding and working knowledge of the mathematical concepts related to the various aspects of industrial education. Algebra, geometry, trigonometry, and general mathematics as applied to laboratory and drawing activities.

EDIT 114 Principles of Typewriting (2) Four hours of laboratory per week. Prerequisite: consent of instructor. The attainment of the ability to operate the typewriter continuously with reasonable speed and accuracy by the "touch".

EDIT 115 Intermediate Typewriting (2) Four hours of laboratory per week. Prerequisite: minimum grade of C in EDIT 114 or consent of instructor. Drills for improving speed and accuracy and an introduction to office production typewriting.

EDIT 116 Principles of Shorthand I (3) Five hours of laboratory per week. Prerequisite: EDIT 115 and consent of instructor. Development of the theory and principles of Gregg shorthand.

EDIT 117 Principles of Shorthand II (3) Five hours of laboratory per week. Prerequisite: consent of instructor. Drills for improving mastery of dictation.

EDIT 121 Mechanical Drawing II (2) Four hours of laboratory per week. Prerequisite: EDIT 101. Working drawings, machine design, pattern layouts, tracing and reproduction. Detail drawings followed by assemblies.

EDIT 124 Sheet Metal Work (2) Four hours of laboratory per week. The manufacturing of articles from metal in sheet form involving the operations of cutting, shaping, soldering, riveting, wiring, folding, seaming, beading, burring, etc. The student is required to develop his own patterns to include parallel line development, radial line development, and triangulation.

EDIT 127 Fundamentals of Electricity Electronics (3) Two hours of lecture and four hours of laboratory per week. Introduction to electricity-electronics in general. Emphasis on electrical circuits and wiring, the measurement of electrical energy, the theory of motors and generators and an introduction to vacuum tubes, transistors and power supplies.

EDIT 160 Design Illustrating I (2) Four hours of laboratory per week. Intended for advertising, interior and landscape design majors. Experience in the use of instruments, equipment, and materials; lettering, line technique, geometric construction, and projection theory. Emphasis on pictorial representation; particularly isometric, oblique, and one and two point perspective.

EDIT 202 Machine Woodworking (3) Two hours of lecture and four hours of laboratory per week. Prerequisite: EDIT 102 or equivalent. The development of comprehensive knowledge of machine woodworkin with emphasis on mass production practices, speciality cuts, laminating procedures, machine maintenance, and consumer understanding.

EDIT 207 Bases For Curriculum Decision in Home Economics (3) Exploration of decisions about priorities in home economics curricula based on the needs of society, the individual, and the structure of the home economics program. The roles of the secondary home economics teacher. Includes observations in area schools.

EDIT 210 Foundry (1) Two hours of laboratory per week. Bench and floor molding and elementary core making. Theory and principles covering foundry materials, tools and appliances.

EDIT 214 Office Typewriting Problems (2) Four hours of laboratory per week. Prerequisite: minimum grade of C in EDIT 115 or consent of instructor. Development of a higher degree of accuracy and speed. The advanced techniques of typewriting with a special emphasis on production.

EDIT 215 Survey of Office Machines (3) Prerequisite: consent of instructor. The various types of office business machines, their capacities and special functions. Development of skill through actual use and demonstration of such machines as accounting, duplicating, dictating and transcribing, adding and calculating, and other functional types of machines and equipment. The handling of practical business problems with machine application.

EDIT 216 Advanced Shorthand and Transcription (3) Five hours of laboratory per week. Prerequisite: minimum grade of C in EDIT 115 and consent of instructor. Emphasis on vocabulary development and new matter dictation for sustained speed at the highest level possible under varying conditions. Transcription under timed conditions with emphasis on production involving quantity and quality of finished product.

EDIT 217 Problems in Transcription (3) Five hours of laboratory per week. Prerequisite: minimum grade of C in EDIT 216 or consent of instructor. A systematic development of recording skills under special and office style dictation and transcription conditions with particular emphasis on transcriptional problems.

EDIT 223 Arc and Gas Welding (1) Two hours of laboratory per week. The development of functional knowledge of the principles and use of electric and acetylene welding. Practical work in the construction of various projects using welded joints. The use and care of equipment, types of welded joints, methods of welding, importance of welding processes in industry,

safety consideration, etc.

EDIT 224 Organized and Supervised Work Experiences I (3) A work experience for students enrolled in the industrial technology program. Opportunities for first-hand experiences with business and industry. The student is responsible for obtaining his own employment with the coordinator advising him in regard to the job opportunities which have optimum learning value. The nature of the work experience desired is outlined at the outset of employment and then evaluations made by the student and the coordinator are based upon the planned experiences. The minimum time is 240 work hours. The internship must be served through continuous employment in a single establishment.

EDIT 226 Fundamental Metalworking Processes (3) Two hours of lecture and four hours of laboratory per week. Introduction to the technology of metalworking. Experience operating metals laboratory equipment including an intensive study of the processes of manufacture.

EDIT 227 Applications of Electronics (3) Two hours of lecture and four hours of laboratory per week. Prerequisite: EDIT 127 or equivalent. An intermediate course providing more extensive knowledge in electricity-electronics including principles of the transmission and reception of radio waves, applications of transistors and other semiconductors and an introduction to industrial electronics.

EDIT 231 Mechanical Drawing III (2) Four hours of laboratory per week. Prerequisite: EDIT 121. A continuation of EDIT 121. The reading of prints representative of a variety of industries. Advanced working drawings, machine design, and pattern layouts.

EDIT 232 Fundamentals of Automotive Technology (3) Two hours of lecture and four hours of laboratory per week. Designed for non-industrial education majors interested in learning the theory and practical operation of the automobile. Mechanical, lubrication, cooling, fuel and electrical systems.

EDIT 233 Fundamentals of Power Technology (3) Two hours of lecture and four hours of laboratory per week. Introduction to power generation, control, and transmission. Emphasis on efficiency of energy converters and use of new and future energy sources, e.g., solar, fuel cell. Laboratory experience in testing and evaluating various energy converters.

EDIT 234 Graphic Communications (3) Two hours of lecture and four hours of laboratory per week. Graphic reproduction processes and related areas used to communicate. Offset, letterpress, screen, gravure, engraving, flexographic, and electrostatic duplication; and relevant history, safety, layout and design, composition, photo conversion, image carriers, image transfer, finishing, binding, paper and ink.

EDIT 241 Architectural Drawing (2) Four hours of laboratory per week. Prerequisite: EDIT 101 or equivalent. Practical experience in the design and planning of houses and other buildings. Working drawings, specifications, and blue-prints.

EDIT 242 Operational Drawing (2) Four hours of laboratory per week. Prerequisite: EDIT 101 or equivalent. A comprehensive course designed to give students practice in the modern drafting methods of industry.

EDIT 262 Basic Metal Machining (3) Two hours of lecture and four hours of laboratory per week. Prerequisite: EDIT 101 or equivalent. Applications of basic metal cutting operations in mass production including work planning, properties of metals and tool materials, conventional metal machining processes and precision measurements.

EDIT 270 Field Experiences (3) Two-hour seminar and field placement for one-half day per week. Introduction to the teaching and learning processes. Career decision information and activities.

EDIT 273 Practicum in Ceramics (3) A lecture-studio course designed to introduce the use of clay and ceramics in a wide variety of educational settings.

EDIT 288 Special Topics in Education (1-3) Prerequisite: consent of department. May be repeated to a maximum of six credits when topic is different.

EDIT 291 Introduction to Plastics Technology (3) Lecture and laboratory. An overview of the plastics industry including properties of plastics, major polymers of the plastics industry and basic molding processes.

EDIT 298 Special Problems in Education (1-6) Prerequisite: consent of department. Available only to freshmen and sophomore majors who have definite plans for individual study of approved problems relative to their preparation for teaching. Credit according to extent of work.

EDIT 302 Woodworking Technology (3) Two hours of lecture and four hours of lecture per week. Prerequisite: EDIT 202 or equivalent. A working knowledge of contemporary woodworking technology, including testing and macroscopic identification of wood. Experience in laboratory maintenance with an opportunity for specialized research of the woodworking industry.

EDIT 304 Administrative Secretarial Procedures (3) Prerequisite: EDIT 216 and 217 or consent of the instructor. The nature of office work, the secretary's function in communication, inter-company and public relations, handling records, supplies and equipment; and in direction of the office forms and procedures in relation to correspondence, mailing, receiving callers, telephoning, handling conferences, and securing business information. Business etiquette and ethics.

EDIT 305 Secretarial Office Practice (3) Seven hours of laboratory per week. Prerequisite: EDIT 304. Laboratory and office experience. A minimum of 90 hours experience under supervision is required. In addition, each student will prepare a written report on an orginal problem previously approved.

EDIT 306 General Shop (3) Organization and administration of a secondary school shop. Skill and knowledge-developing activities in a variety of shop areas.

EDIT 311 Laboratory Practicum in Industrial Arts Education (3) Six hours of laboratory per week. Prerequisite: 18 semester hours of laboratory work and drawing. The development of instructional materials and the refinement of instructional methods pertinent to the teaching of industrial arts at the secondary school level.

EDIT 324 Organized and Supervised Work Experiences II (3) A work experience for students enrolled in the industrial technology program. Opportunities for first-hand experiences with business and industry. The student is responsible for obtaining his own employment with the coordinator advising him in regard to the job opportunities which have optimum learning value. The nature of the work experience desired is outlined at the outset of employment and then evaluations made by the student and the coordinator are based upon the planned experiences. The minimum time is 240 work hours. The internship must be served through continuous employment in a single establishment.

EDIT 326 Science and Technology of Metals (3) Prerequisite: EDIT 226 or equivalent. Three hours of lecture, three hours of laboratory per week. Investigation of the physical properties of metals. Emphasis on identification, examination, and analysis of metals; operation of metallurgical laboratory equipment, study of iron carbon diagrams, heat and surface treatments, and plastics deformation.

EDIT 327 Electronic Semi-Conductor Applications (3) Two hours of lecture and four hours of laboratory per week. Prerequisite: EDIT 127 or equivalent. An advanced course providing more extensive knowledge in electricity or electronics including the advanced theory and applications of semi-conductors and the principles of the storage and transmission of electronically coded information.

EDIT 332 Advanced Procedures in Automotive Technology (3) Two hours of lecture and six hours of laboratory per week. Prerequisite: EDIT 232 or equivalent. Designed for students who have a background in engine systems and wish to broaden their knowledge. Emission control, electrical systems, and diagnostic problem solving.

EDIT 334 Photographic and Electronic Graphic Communications (3) Two hours of lecture and four hours of laboratory per week. Prerequisite: EDIT 234 or equivalent. An intermediate course on contemporary processes relevant to graphic reproduction. Photographic, electronic and computer assisted composition techniques, contract photoprinting, line and halftone process photography, microphotography, photo screen printing and photo offset lithography.

EDIT 335 Continuous Tone Photographic Technology (3) Two hours of lecture and four hours of laboratory per week. Prerequisite: EDIT 234 or permission of instructor. Theory and techniques pertaining to black-and-white and color light sensitive materials. Emphasis on a study of history, cameras, exposure techniques, composition, illumination, film processing, contact printing, enlarging, darkroom controls and finishing as related to graphic communications.

EDIT 340 Methods of Teaching Office Skills (3) An examination and evaluation of the aims, methods, and course contents of each of the office skill subjects offered in the high school curriculum.

EDIT 341—343 curriculum, instruction and observation courses. Offered in separate courses for the various subject matter areas. The objectives, selection and organization of subject matter, appropriate methods, lesson plans, textbooks and other instructional materials, measurement, and other topics pertinent to the particular subject matter area are treated. Twenty periods of observation. Students must reserve all day each tuesday for observation in public schools.

EDIT 341 Curriculum, Instruction, and Observation: Business Education (3)

EDIT 342 Curriculum, Instruction, and Observation: Home Economics Education (3)

EDIT 343 Curriculum, Instruction, and Observation: Distributive Education (3)

EDIT 344 Curriculum, Instruction, and Observation: Industrial Arts Education (3)

EDIT 350 Methods of Teaching: Trades and Industry Education (3) Intended for vocational and occupational teachers. The identification and analysis of factors essential to helping others learn; types of teaching situations and techniques; measuring results and grading student progress in shop and related technical subjects.

EDIT 353 Fire Safety Codes and Standards (3) The legal response to the problems of fire safety. Legal issues surrounding the implementation and enforcement of codes with application to industry.

EDIT 357 Tests and Measurements (3) The construction of objective tests for occupational and vocational subjects.

EDIT 360 Industrial Production Technology (3) Prerequisite: EDIT 262 or consent of instructor. Principles of industrial and laboratory organization. Economics of production, capital equipment, labor costs, cost of materials. Industrial plant siting, environmental considerations, plant layout and design. Engineering decisions for production, methods analysis, value analysis, quality control. Industrial relations.

EDIT 362 Advanced Metal Machining Processes (3) Two hours of lecture and four hours of laboratory per week. Prerequisite: EDIT 262 or equivalent. Experience in complex metal cutting operations; special heat treating processes; super precision measurements; electrical, chemical and ultrasonic metal removal, and high energy rate forming with experimentation in specialized machining operations.

EDIT 381 Inorganic Nonmetallic Materials (3) Two hours of lecture and four hours laboratory per week. Introduction to inorganic, nonmetallic materials which are applied in the manufacturing and construction industries.

EDIT 391 Plastics Processing Fundamentals (3) Lecture and laboratory. Prerequisite: EDIT 291 or permission of the department. Experience with plastics production equipment including an intensive study of thermoplastic and thermosetting resins and their fabrication processes.

EDIT 399 Trade Competence (1-20) An examination to determine and evaluate the trade competence of students pursuing a degree in the field of vocational-industrial education.

EDIT 400 Technology Activities For the Elementary School (3) Experience in the development and use of technology and career education instructional materials for construction activities in an interdisciplinary approach to elementary school education.

EDIT 401 Essentials of Design (2) Two laboratory periods a week. Prerequisite: EDIT 101 and basic laboratory work. A study of the basic principles of design and practice with application to the construction

of laboratory projects.

EDIT 402 Methods and Materials in Teaching Bookkeeping and Related Subjects (3) Important problems and procedures in the mastery of bookkeeping and related office knowledge and skills. Consideration of materials and teaching procedures.

EDIT 403 Problems in Teaching Office Skills (3) Problems in development of occupational competency, achievement tests, standards of achievement, instructional materials, transcription, and the integration of office skills.

EDIT 404 Basic Business Education in the Secondary Schools (3) Subject matter selection, methods of organization; and presenting business principles, knowledge and practices.

EDIT 405 Business Communications (3) The fundamental principles of effective written communication. Word usage, grammar, punctuation, principles and procedures for writing business letters, and the principles and procedures for writing formal research reports.

EDIT 406 Word Processing (3) An introduction to the word processing field with emphasis on word processing theory and concepts including hands-on equipment training. Management of office personnel, procedures, and equipment, the incorporation of word processing into the school curriculum, the automated office of the future and career opportunities. On-site field experiences are scheduled throughout the course.

EDIT 410 Administration and Program Development For Industrial Arts and Vocational Education (3) Principles and practices of program development and supervision with reference to the role of the departmental chairperson in vocational, technical, and industrial arts programs at the secondary and post-secondary levels.

EDIT 412 Management of Physical Facilities in Industrial Arts and Vocational Education (3) Principles, practices, and theory related to the role of the departmental chairperson charged with the management of the physical facilities in vocational, technical, and industrial arts laboratories.

EDIT 413 Methods and Materials in Distributive Education (3) Basic methods and materials needed to teach the preparatory classroom related instruction of a one or two year distributive education program. The organization of special supplementary materials for individual and group instruction. Youth club programs, organization, and administration.

EDIT 414 Organization and Coordination of Cooperative Education Programs (3) The organization of a cooperative distributive education program, the development of an effective cooperative relationship between coordinator and training sponsor, the selection, orientation, and training of sponsors, analysis of training opportunities, reports and records; the evaluation and selection of students for part-time cooperative work assignments; and the evaluation of the program.

EDIT 415 Financial and Economic Education I (3) Problems of teaching courses in personal finance and economics in the public schools, including materials and resources.

EDIT 416 Financial and Economic Education II (3) Continuation of EDIT 415.

EDIT 421 Industrial Arts in Special Education (3) Four hours laboratory and one hour lecture per week. Prerequisite EDSP 470 and 471 or consent of instructor. Experiences of a technical and theoretical nature in industrial processes applicable for classroom use. Emphasis on individual research in the specific area of major interest in special education.

EDIT 422 Student Teaching: Industrial Arts Education (2-12)

EDIT 425 Analysis of Industrial Training Programs I (3) An overview of the function of industrial training, including methods of instruction, types of programs and their organization, development of program objectives, and evaluation.

EDIT 426 Analysis of Industrial Training Programs II (3) Prerequisite: EDIT 425. Continuation of EDIT 425. Studies of training programs in a variety of industries, including plant program visitation, training program development, and analysis of industrial training research.

EDIT 427 Experimental Electronics (2) Six hours of laboratory per week. Student investigation of an area of electronics of particular interest or usefulness at a depth appropriate for student background and need. Emphasis on student-based objectives relating to one or more of the following: digital circuitry, communication, energy conversion, test equipment utilization, analog circuitry.

EDIT 432 Student Teaching: Business Education (2-12)

EDIT 433 Advanced Topics in Power Technology (3) Two hours of lecture and four hours of laboratory per week. Prerequisite: EDIT 233 or equivalent. The development of a competency in building and evaluating the performance of energy transmission, control and converter systems. Methane digestors, solar collectors, electric motors, steam turbines, and fluid power systems.

EDIT 434 Color Reproduction in Graphic Communications (3) Two hours of lecture and four hours of laboratory per week. Prerequisite: EDIT 334 or equivalent. An advanced course in the theory and processes of color graphic reproduction. Continuous tone color photography, flat color preparation, process color separations and the reproduction of a multi-color product on a semi-automatic or automatic printing press.

EDIT 435 Curriculum Development in Home Economics (3) An analysis of curriculum development including the tools for planning, managing, and evaluating the teaching/learning environment of conceptual curriculum design.

EDIT 436 Analysis of Child Development Laboratory Practices (3) Prerequisite: FMCD 332 or EDHD 411. Integration of child development theories with laboratory practices, observation and participation in a secondary school child development laboratory arranged to alternate with class meetings.

EDIT 440 Industrial Hygiene (3) Introduction to the concept of industrial hygiene and environmental health. Evaluation techniques, instrumentation for identification of problems, design parameters for achieving control over environmental epidemiological and toxicological hazards.

EDIT 442 Student Teaching: Home Economics Education (2-12)

EDIT 443 Industrial Safety I (3) The history and development of effective safety programs in modern industry including causes, effects and values of industrial safety education including fire prevention and hazard controls.

EDIT 444 Industrial Safety II (3) Study of exemplary safety practices through conference discussions, group demonstration, and organized plant visits to selected industrial situations. Methods of fire precautions and safety practices. Evaluative criteria in safety programs.

EDIT 445 Systems Safety Analysis (3) The development of systems safety a review of probability concepts and the application of systems technique to industrial safety problems. Hazard mode and effect, fault tree analysis and human factors considerations.

EDIT 450 Training Aids Development (3) Study of the aids in common use. Sources and applications. Special emphasis on principles to be observed in making aids useful to laboratory teachers. Actual construction and application of aid devices will be required.

EDIT 451 Research and Experimentation in Industrial Arts (3) A laboratory-seminar course designed to develop persons capable of planning, directing and evaluating effective research and experimentation procedures with the materials, products and processes of industry.

EDIT 452 Student Teaching: Marketing and Distributive Education (2-12)

EDIT 453 Fire Safety Research and Transfer (3) The technological transfer of scientific findings to private sector fire safety. Review of research applicable to the adequacy and reliability of fire safety in industry.

EDIT 454 Private Fire Protection Analysis I (3) Risk analysis, life safety and property conservation from fire in industrial properties and complexes. Emphasis on a systems approach for implementing private fire protection.

EDIT 455 Private Fire Protection Analysis II (3) Prerequisite: EDIT 448. Internal property detection and fire suppression systems that can mitigate a fire in the incipient stage. Review of systems, with emphasis on the performance objectives of preventing, controlling, and extinguishing fires.

EDIT 457 Tests and Measurements (3) The construction of objective tests for occupational and vocational subjects. Use of measures in domains of learning and examination of test analysis techniques.

EDIT 460 Design Illustrating II (2) Four hours of laboratory per week. Prerequisite: EDIT 160. Advanced drawing, rendering, shadow construction, lettering techniques and advanced pictorial representation techniques.

EDIT 461 Principles of Vocational Guidance (3) The underlying principles of guidance and their application to the problems of educational and occupational adjustment of students of all ages.

EDIT 462 Occupational Analysis and Course Construction (3) Application of the techniques of occupational and job analysis concepts to instructional development and the design of occupational programs.

EDIT 464 Laboratory Organization and Management (3) The basic elements of organizing and managing an industrial education program, the selection of equipment, facility development, legal responsibilities of laboratory instructors, inventory, and storage control.

EDIT 465 Modern Industry (3) The manufacturing, service, and extractive industries in American social, economic, and cultural patterns. Representative basic industries studied from the viewpoints of personnel and management organization, industrial relations, production procedures, distribution of products, etc.

EDIT 466 Educational Foundations of Industrial Arts (3) A study of the factors which place industrial arts education in a well-rounded program of general education.

EDIT 467 Problems in Occupational Education (3) The procurement, assembly, organization, and interpretation of data relative to the scope, character and effectiveness of occupational education.

EDIT 470 Numerical Control in Manufacturing (3) The historical development of numerical control (N/C) in manufacturing, recent industrial trends in N/C, and a variety of N/C equipment and support services. N/C machine operations: machine motions, positioning control systems, N/C tapes and their preparation, manual and computer assisted (APT III) part programming. Experience in product design, part programming, and product machining.

EDIT 471 History and Principles of Vocational Education (3) The development of vocational education from primitive times to the present with special emphasis given to the vocational education movement with the american program of public education.

EDIT 472 Quality Control and Assurance in Industrial Settings (3) Principles and theory of quality control and assurance, with focus on "quality of conformance." Organizational aspects of QC/QA, data collection and analysis, quality control in input, process and output functions, and human and cultural dimensions of quality control.

EDIT 474 Organization and Administration of Youth Groups (3) Principles, practices, and theoretical considerations related to youth organizations as a co-curricular function of the subject areas of industrial arts, business and distributive education, home economics, health occupations and trades and industry.

EDIT 475 Recent Technological Developments in Products and Processes (3) Recent technological developments as they pertain to the products and processes of industry. The nature of newer products and processes and their effect upon modern industry and/or society.

EDIT 476 Application of Technology to Societal Problems (3) A study of alternative solutions of a technological nature with respect to such areas as housing, transportation, energy, communications, production, trash and waste disposal, water development, and pollution control.

EDIT 481 Manufacture and Use of Inorganic Nonmetallic Materials (3) Two hours of lecture and four

hours of laboratory per week. Prerequisite: EDIT 381 or equivalent. Fabrication of products from calculated compositions; application of forming process; utilization of compositions; experiences with property analysis and product design.

EDIT 482 Student Teaching: Trade and Industrial Education (2-12)

EDIT 484—486 Field Experiences in Vocational Areas. Supervised work experience in an occupation related to vocational education. Application of theory to work situations as a basis for teaching in vocational education programs. By individual arrangement with advisor.

EDIT 485 Field Experiences in Business Education (3)

EDIT 486 Field Experiences in Marketing and Distributive Education (3)

EDIT 488 Selected Topics in Education (1-3) Prerequisite: Consent of department. May be repeated to a maximum of six credits when topic is different.

EDIT 489 Field Experiences in Education (1-4) Prerequisite: Consent of department. Planned field experience in education-related activities. Credit not to be granted for experiences accrued prior to registration.

EDIT 491 Plastics Design and Equipment Selection (3) Lecture and laboratory. Prerequisite: EDIT 391 or permission of the department. Experience with material selection, product design, mold design, auxiliary equipment and fixtures.

EDIT 493 Home Economics for Special Need Learners (3) Mental, emotional, social and physical handicaps affecting learners in home economics education settings. The unique needs and abilities of special learners and methods of teaching daily living skills.

EDIT 498 Special Problems in Education (1-6) Prerequisite: Consent of department. Available only to majors who have definite plans for individual study of approved problems. Credit according to extent of work.

EDIT 499 Workshops, Clinics, and Institutes (1-6) The maximum number of credits that may be earned under this course symbol toward any degree is six semester hours; the symbol may be used two or more times until six semester hours have been reached. The following type of educational enterprise may be scheduled under this course heading: Workshops conducted by the College of Education (or developed cooperatively with other colleges and universities) and not otherwise covered in the present course listing; clinical experiences in pupil-testing centers, reading clinics, speech therapy laboratories, and special education centers; institutes developed around specific topics or problems and intended for designated groups such as school superintendents, principals and supervisors.

EDMS — Measurement, Statistics, and Evaluation

EDMS 410 Principles of Testing and Evaluation (3) Basic principles including the steps in the specification of instructional objectives and subsequent development of teacher-made tests; problems in the use and interpretation of achievement and aptitude tests; introduction to the development and use of non-testing evaluation procedures; basic consideration in the assignment of marks and grades; introduction to computer technology as applied to measurement.

EDMS 451 Introduction to Educational Statistics (3) Designed as a first course in statistics for students in education. Emphasis is upon educational applications of descriptive statistics, including measures of central tendency, variability and association. Also included are inferential statistics through one-way ANOVA.

EDMS 465 Algorithmic Methods in Educational Research (3) Introduction to the use of the computer as a tool in educational research. Instruction in a basic scientific computer source language as well as practical experience in program writing for solving statistical and educational research problems.

EDMS 489 Field Experiences in Measurement and Statistics (1-4) Prerequisites: Consent of department. Planned field experience in education-related activities. Credit not to be granted for experiences accrued prior to registration.

EDMS 498 Special Problems in Measurement and Statistics (1-3) Prerequisite: consent of instructor. Available only to education majors who have formal plans for individual study of approved problems. Repeatable for credit to a maximum of six credits.

EDPA — Education Policy, Planning and Administration

EDPA 201 Education in Contemporary American Society (3) An examination of the relationship between education and the social environment in contemporary American society. Issues of equality or equal opportunity; individual and cultural differences; education outside of schools; the control of education; and the future of education.

EDPA 210 Historical and Philosophical Perspectives On Education (3) An examination of illustrative historical and philosophical examples of the interplay of ideas and events in the shaping of educational aims and practices from ancient cultures to modern technological societies.

EDPA 288 Special Problems in Education (1-6) Prerequisites: consent of education advisor. Available only to freshmen and sophomore students who have definite plans for individual study of approved problems relative to their preparation for teaching.

EDPA 301 Foundations of Education (3) Prerequisites: EDHD 300; completion of at least 90 hours and approval for admission to teacher education. Historical, social, cultural, and philosophical foundations of American education. Considers education as a profession, and the organizational structure, operation and function of modern school systems. Comparative education and contemporary issues are included.

EDPA 412 Logic of Teaching (3) An analysis of the structure of basic subject matters in the curriculum and of the standard logical moves in teaching.

EDPA 440 Utilization of Educational Media (3) Survey of classroom uses of instructional media. Techniques for integrating media into instruction. Includes preparation of a unit of instruction utilizing professional and teacher produced media.

EDPA 441 Instructional Materials Development (3) The planning, production, and evaluation of a variety of instructional materials for use in education and training. Graphic design, lettering, transparencies, mounting, laminating, still photography, super 8mm photography, audio, video, slide/tape, planning storyboards and scripts.

EDPA 442 Instructional Media Services (3) Prerequisites: teachhig experience and EDPA 440, or equivalent. Procedures for coordinating instructional media programs; instructional materials acquisition, storage, scheduling, distribution, production, evalution and other service responsibilities; instructional materials center staff coordination of research, curriculum improvement and faculty development programs.

EDPA 443 Instructional Television Utilization (3) Combining televised lessons, on-campus seminars, and related workbook assignments, this course focuses upon planning for the various uses of instructional television with students. State, local school unit, school, and classroom uses will be illustrated through film and studio production. The aspects of producing ITV programs are developed through the television lessons and "hands-on" assignments of the seminars.

EDPA 444 Programmed Instruction (3) Analysis of programmed instruction techniques, selection, utilization and evaluation of existing programs and teaching machines; developing learning objectives, writing and validating programs.

EDPA 471 The Legal Rights and Obligations of Teachers and Students (3) Selected state and federal court decisions, legislation, and executive guidelines regulating public education: speech and other forms of expression, privacy, suspensions, expulsions, search and seizure, tort liability for negligence (including education malpractice), hiring, promotion, dismissal and non-renewal of teachers. No prior legal training required.

EDPA 488 Special Topics In Education Policy and Administration (1-3) Prerequisite: consent of instructor. Special and intensive treatment of current topics and issues in education policy and administration. Repeatable to a maximum of six credits.

EDPA 489 Field Experiences In Education (1-4) Prerequisites: Consent of department. Planned field experience in education-related activities. Credit not to be granted for experiences accrued prior to registration.

EDPA 498 Special Problems in Education (1-3) Prerequisite: consent of instructor. Available only to mature students who have definite plans for individual study of approved problems.

EDPA 499 Workshops, Clinics, and Institutes (1-6) The maximum number of credits that may be earned under this course symbol toward any degree is six semester hours; the symbol may be used two or more times until six semester hours have been reached. The following type of educational enterprise may be scheduled under this course heading: Workshops conducted by the College of Education (or developed cooperatively with other colleges and universities) and not otherwise covered in the present course listing; clinical experiences in pupil-testing centers, reading clinics, speech therapy laboratories, and special education centers; institutes developed around specific topics or problems and intended for designated groups such as school superintendents, principals and supervisors.

EDSP — Education, Special

EDSP 210 Introduction to Special Education (3) Characteristics and needs of all types of handicapped children. Current issues in special education.

EDSP 288 Special Topics in Teacher Education (1-3) Prerequisite: major in education or consent of department. May be repeated to a maximum of six credits when topic is different.

EDSP 298 Special Problems in Teacher Education (1-6) Prerequisite: consent of advisor. Available only to freshmen and sophomore education majors who have definite plans for individual study of approved problems relative to their preparation for teaching. Credit according to extent of work.

EDSP 320 Introduction to Assessment in Special Education (3) Prerequisites: EDSP 210 and STAT 100; pre- or corequisites: EDSP 321 and 322. Assessment instruments and procedures and specific criterion-referenced and norm-referenced measures used in special education. Enrollment limited to special education majors.

EDSP 321 Comparative Approaches to Behavior and Classroom Management in Special Education (3) Prerequisite: EDSP 210; pre- or corequisites: EDSP 320 and 322. The development of skill in a variety of behavior and classroom management techniques used in special education. Enrollment limited to special education majors.

EDSP 322 Field Placement in Special Education I (2-3) Pre- or corequisites: EDSP 320 and 321. Practicum experience in special education setting. The application of assessment and classroom management procedures. Enrollment limited to special education majors. Field placement for two or three half-days per week.

EDSP 330 Families and the Education of Handicapped Children (3) Prerequisite: EDSP 321. Corequisites: EDSP 331, EDSP 332 and EDSP 333. Emphasis on the impact of handicapped children on families and strategies for communicating and working with families. Enrollment limited to special education majors.

EDSP 331 Introduction to Curriculum and Instructional Methods in Special Education (3) Prerequisites: EDSP 320 and 321, pre- or corequisite: EDSP 330, 332, and EDSP 333. Instructional principles and programs in special education. Enrollment limited to special education majors.

EDSP 332 Interdisciplinary Communication in Special Education (3) Prerequisites: EDSP 320 and 321, pre- or corequisites: EDSP 330, 331 and EDSP 333. Terminology, procedures and professional roles specific to persons providing services to handicapped children. Enrollment limited to special education majors.

EDSP 333 Field Placement in Special Education II (2-3) Prerequisite: EDSP 322; pre- or corequisite: EDSP 330, 331 and EDSP 332. Practicum experience in special education setting. Opportunities to apply curriculum methods and materials.

EDSP 349 Student Teaching of Exceptional Children (8) Limited to Special Education majors. Student teaching full time for eight weeks, with exceptional children; a second full time eight week experience is required in EDCI 482 or EDSP 417 or 437 or 457 or 467.

EDSP 400 Curriculum and Instructional Methods For Severely Handicapped Students (3) Corequisites: EDSP 402 and 404. Methodology and curriculum for severely handicapped students in functional skill areas. Enrollment limited to those admitted to severely handicapped specialty area.

EDSP 401 Environmental and Physical Adaptations for Severely Handicapped Students (3) Pre- or corequisite: EDSP 411 and 412, or EDSP 430 and 431. Medical, physical, and management problems of severely handicapped individuals.

EDSP 402 Field Placement: Severely Handicapped I (2-5) Pre- or corequisites: EDSP 400 and 404. Practicum experience in settings serving severely handicapped individuals. Enrollment limited to those admitted to severely handicapped specialty area. Field placement for two to five half-days per week.

EDSP 403 Physical and Communication Development for Severely Handicapped Students (3) Prerequisite: EDSP 400. Co-requisite: EDSP 405 and 410. The communication needs, methods, and alternatives for severely handicapped individuals.

EDSP 404 Education of Autistic Children (3) Pre- or corequisite: EDSP 400 and 402. The characteristics and educational needs and methods for children diagnosed as autistic.

EDSP 405 Field Placement: Severely Handicapped II (2-5) Prerequisite: EDSP 402, pre- or corequisite: EDSP 403 and 410. Practicum experience in settings serving severely handicapped individuals. Field placement for two to five half-days per week.

EDSP 410 Community Functioning Skills For Severely Handicapped Students (3) Prerequisite: EDSP 400. Corequisite: EDSP 405. Instructional techniques and curriculum development strategies related to community functioning skills for severely handicapped students.

EDSP 411 Field Placement: Severely Handicapped III (2-5) Prerequisite: EDSP 405, pre- or corequisite: EDSP 412. Practicum experience in settings serving severely handicapped individuals. Field placement for two to five half-days per week.

EDSP 412 Vocational Instruction For Severely Handicapped Students (3) Corequisite: EDSP 411. The development of vocational skills with severely handicapped individuals.

EDSP 417 Student Teaching: Severely Handicapped (4-8) Student teaching, full time for eight weeks, with severely handicapped individuals. Limited to special education majors admitted to severely handicapped specialty area.

EDSP 418 Seminar: Issues and Research Related to the Instruction of the Severely Handicapped (1-3) Examines the current research related to the instruction of severely handicapped individuals. Repeatable up to 6 credits, provided content is different.

EDSP 420 Developmental and Behavioral Characteristics of Nonhandicapped and Handicapped Infants and Young Children (3) Corequisite: EDSP 421. Study of the developmental, behavioral, and learning characteristics of nonhandicapped and handicapped infants and young preschool children. Divergent and parallel patterns of development among the respective groups of children. Enrollment limited to students admitted to early childhood special education area of specialization.

EDSP 421 Field Placement: Early Childhood Special Education I (2-3) Pre- or corequisite: EDSP 420. Practicum experience in settings serving preschool handicapped children. Opportunities for studying the patterns of development and learning among nonhandicapped and handicapped infants and older preschoolers. Enrollment limited to students admitted to early childhood specialty. Field placement for two or three half-days per week.

EDSP 422 Curriculum and Instruction in Early Childhood Special Education (Moderate to Mild: 3-8 Years) (3) Prerequisite: EDSP 420. Corequisite: EDSP 424 and EDCI 416. Characteristics, methods and materials for the instruction of young children (ages 3-8) traditionally labeled mild to moderately handicapped.

EDSP 423 Psychoeducational Assessment of Preschool Handicapped Children (3) Prerequisite: EDSP 420 and 422. Corequisite: EDSP 430 and 431. Current psychoeducational assessment and evaluation procedures used with profoundly to moderately handicapped infants and young preschool children. Psychometric, criterion-referenced, developmental checklists, and automated and ecological assessment procedures. Administration of selected assessment instruments.

EDSP 424 Field Placement: Early Childhood Special Education II (Moderate to Mild) (2-4) Prerequisite: EDSP 421, pre- or corequisite: EDSP 422. Practicum experience in settings serving young (ages 3 to 8) mild to moderately handicapped children in self-contained and integrated early childhood programs. Opportunities to apply educational methods and materials. Field placement for two to four half-days per week.

EDSP 430 Intervention Techniques and Strategies For Preschool Handicapped Children (Severe to Moderate, Birth - 6 Years) (3) Prerequisite: EDSP 420 and 422. Corequisites: EDSP 423 and 431. Current approaches to the psychoeducational treatment of preschool severely to moderately handicapped children. Emphasis on multi-dimensional approach to intervention with handicapped preschoolers.

EDSP 431 Field Placement: Early Childhood Special Education III (Severe to Moderate) (2-4) Prerequisite: EDSP 424, pre- or corequisite: EDSP 430 and 423. Opportunities to apply techniques, strategies, methods and materials for educating severely to moderately handicapped infants and young children. Field placement for two to four half-days per week.

EDSP 437 Student Teaching: Early Childhood Special Education (4-8) Student teaching, full time for eight weeks, with handicapped infants and preschool children. Limited to special education majors in early childhood special education specialty area.

EDSP 438 Seminar: Special Issues In Early Childhood Special Education (1-3) Prerequisite: consent of instructor. Study of current issues and research concerning education of preschool handicapped children. Repeatable up to 6 credits, provided content is different.

EDSP 440 Assessment and Instructional Design for the Educationally Handicapped: Cognitive and Psychosocial Development (3) Prerequisite: EDSP 441 and 442. Pre- or corequisite: EDSP 443 and 445. Learning style, cognitive, and problem-solving strategies, and psychosocial behavior of educationally handicapped individuals at elementary to secondary levels. Characteristics, assessment and instruction. Enrollment limited to Special Education majors accepted into educationally handicapped area of specialization.

EDSP 441 Assessment and Instructional Design for the Educationally Handicapped: Oral Language and Communication Disorders (3) Pre- or corequisite: EDSP 443 and 445. Characteristics of individuals with oral language and communication disorders, assessment of such disorders and instructional strategies, curricula and materials. Enrollment limited to Special Education majors accepted into educationally handicapped area of specialization.

EDSP 442 Field Placement: Educationally Handicapped I (2-3) Pre- or corequisite: EDSP 441. Practicum experience in settings serving educationally handicapped individuals. Demonstration of the content of EDSP 440 and 441. Enrollment limited to Special Education majors admitted to educationally handicapped specialty.

EDSP 443 Assessment and Instructional Design for the Educationally Handicapped: Reading and Written Communication Disorders (3) Prerequisite: EDSP 441, pre- or corequisites: EDSP 440 and 445. Characteristics and assessments of individuals with reading and written communication disorders at elementary to secondary levels, and methods of teaching reading and written language skills to such individuals. Adaptation of regular instructional methods and curricula. Curricula and strategies designed specifically for educationally handicapped individuals.

EDSP 445 Field Placement: Educationally Handicapped II (2-4) Prerequisite: EDSP 442 pre- or corequisite: EDSP 440 and 443. Practicum experience in settings serving educationally handicapped. The application of reading and mathematics assessment and instructional procedures. Field placement for two to four half-days per week.

EDSP 446 Instructional Design for the Educationally Handicapped: Functional Living Skills (3) Pre- or corequisite: EDSP 447. Instructional methods, curricula and materials designed to teach functional living skills to educationally handicapped individuals at elementary to secondary levels. Curricula and teaching strategies in science and social studies used in general education and adaptations for educationally handicapped individuals.

EDSP 447 Field Placement: Educationally Handicapped III (2-4) Prerequisite: EDSP 445, pre- or corequisite: EDSP 446 and 450. Practicum experience in settings serving educationally handicapped individuals. The application of the content of EDSP 446 and 450. Field placement for two to four half-days per week.

EDSP 450 Program Management For the Educationally Handicapped (3) Corequisites: EDSP 446 and 447, or EDSP 464 and 465. Emphasis on skills in managing programs for educationally handicapped individuals. Service delivery models; scheduling, establishing referral, assessment and follow through procedures; methods for mainstreaming; training aides and volunteers.

EDSP 457 Student Teaching: Educationally Handicapped (4-8) Student teaching, full time for eight weeks, with educationally handicapped individuals.

EDSP 458 Seminar: Special Issues and Research Related to the Educationally Handicapped (1-3) Prerequisite: consent of instructor. Current issues and research concerning the education of educationally handicapped individuals. Repeatable to maximum of 6 credits, provided content is different.

EDSP 460 Career/vocational Education For the Handicapped (3) Corequisite: EDSP 461. Introduction to career/vocational education for the handicapped. Historical and current issues and trends, characteristics and training needs of handicapped individuals and review of existing programs. Enrollment limited to special education majors admitted into the career/vocational area of specialization.

EDSP 461 Field Placement: Career/Vocational I (2-3) Pre- or corequisite: EDSP 460. Visitation and observation of sites relevant to career/vocational education for the handicapped, including various program models such as special center-based, comprehensive school-based, vocational center-based, community-based, and public and private sheltered and open employment sites. Enrollment limited to special education majors admitted to career/vocational area of specialization. Field placement for two or three half-days per week.

EDSP 462 Career/Vocational Assessment and Instruction For the Mild to Moderately Handicapped I (3) Prerequisite: EDSP 460. Corequisites: EDSP 463, EDSP 443, and EDCI 456. The first course of a two course sequence focusing on assessment, interpretation of assessment results, and planning, delivery and evaluation of instruction in career/vocational education for the handicapped. Vocational and prevocational preparation, daily living skills and personal-social development.

EDSP 463 Field Placement: Career/Vocational II (2-3) Prerequisite: EDSP 461, pre- or corequisite: EDSP 462. Practicum experience in career/vocational programs for the handicapped. Field placement for two or three half-days per week.

EDSP 464 Career/Vocational Assessment and Instruction for Mild to Moderately Handicapped II (3) Prerequisite: EDSP 462. Pre-or Corequisite: EDSP 465 and EDSP 450. A continuation of EDSP 462.

EDSP 465 Field Placement: Career/Vocational III (2-3) Prerequisite: EDSP 463, pre- or corequisite: EDSP 464. Practicum experience in career/vocational programs for the handicapped. Field placement for two or three half-days per week.

EDSP 467 Student Teaching: Career/Vocational (4-8) A full-time eight week field assignment in a setting providing career/vocational education for handicapped students. Enrollment limited to Special Education majors who have successfully completed coursework in career/vocational area of specialization.

EDSP 468 Special Topics Seminar in Career/Vocational Education For the Handicapped (1-3) Prerequisite: permission of instructor. Current issues and research relating to career/vocational education of the handicapped. Repeatable to maximum of 6 credits, provided content is different.

EDSP 470 Introduction to Special Education (3) Prerequisite: EDSP 288. Designed to give an understanding of the needs of all types of exceptional children. Stressing preventive and remedial measures.

EDSP 471 Characteristics of Exceptional Children: Mentally Retarded (3) Prerequisite: EDSP 470 or equivalent. Studies the diagnosis, etiology, physical, social and emotional characteristics of exceptional children.

EDSP 472 Education of Exceptional Children: Mentally Retarded (3) Prerequisite: EDSP 471 or equivalent. Offers practical and specific methods of teaching exceptional children. Selected observation of actual teaching may be arranged.

EDSP 473 Curriculum For Exceptional Children: Mentally Retarded (3) Prerequisite: EDSP 471 or equivalent. Examines the principles and objectives guiding curriculum for exceptional children; gives experience in developing curriculum; studies various curricula currently in use.

EDSP 475 Education of the Slow Learner (3) Studies the characteristics of the slow learner and those educational practices which are appropriate for the child who is functioning as a slow learner.

EDSP 481 Characteristics of Exceptional Children: Gifted (3) Prerequisite: EDSP 470 or equivalent. Studies the diagnosis, etiology, physical, social, and emotional characteristics of exceptional children.

EDSP 482 Education of Exceptional Children: Gifted (3) Prerequisite: EDSP 481 or equivalent. Offers practical and specific methods of teaching exceptional children. Selected observation of actual teaching may be arranged.

EDSP 483 Curriculum For Exceptional Children: Gifted (3) Prerequisite: EDSP 481 or equivalent. Examines the principles and objectives guiding current curriculum for exceptional children; gives experience in developing curriculum; studies various curricula currently in use.

EDSP 488 Selected Topics in Teacher Education (1-3) Prerequisite: major in education or consent of department. May be repeated to a maximum of six credits when topic is different.

EDSP 489 Field Experiences in Special Education (1-4) Prerequisite: Consent of department. Planned field experience in education-related activities. Credit not to be granted for experiences accrued prior to registration.

EDSP 491 Characteristics of Exceptional Children: Perceptual Learning Problems (3) Prerequisite: EDSP 470 or equivalent. Studies the diagnosis, etiology, physical, social, and emotional characteristics of exceptional children.

EDSP 492 Education of Exceptional Children: Perceptual Learning Problems (3) Prerequisite: EDSP 491 or equivalent. Offers practical and specific methods of teaching exceptional children. Selected observation of actual teaching may be arranged.

EDSP 493 Curriculum For Exceptional Children: Perceptual Learning Problems (3) Prerequisite: EDSP 492 or equivalent. Examines the principles and objectives guiding curriculum for exceptional children; gives experience in developing curriculum; studies various curricula currently in use.

EDSP 498 Special Problems in Teacher Education (1-6) Prerequisite: consent of advisor. Available only to education majors who have definite plans for individual study of approved problems. Credit according to extent of work.

EDSP 499 Workshops, Clinics, and Institutes in Special Education (1-6) The maximum number of credits that may be earned under this course symbol toward any degree is six semester hours; the symbol may be used two or more times until six semester hours have been reached. The following type of educational enterprise may be scheduled under this course heading: workshops conducted by the special education department (or developed cooperatively with other departments, colleges and universities) and not otherwise covered in the present course listing. Laboratories, and special education centers, institutes developed around specific topics or problems and intended for designated groups such as school superintendents, principals and supervisors.

EDUC — Education

EDUC 388 Special Topics in Education (1-3) Prerequisite: consent of instructor. Repeatable for a maximum of 6 hours.

ENAE — Engineering, Aerospace

ENAE 201 Introduction to Aerospace Engineering I (2) Prerequisite: ENES 110. History of aeronautical engineering, technical fundamentals, the standard atmosphere, basic aerodynamics, and the aerodynamics of airfoils, wings and other aerodynamic shapes.

ENAE 202 Introduction to Aerospace Engineering II (2) Prerequisite: ENAE 201. Elements of airplane performance. Principles of airplane stability and control. Basic astronautics, including orbital and escape trajectories, flight propulsion fundamentals, propellers, IC engines, jet and rocket engines.

ENAE 305 Aerospace Laboratory I (3) Prerequisite: ENEE 300. Pre or corequisites: ENAE 345, ENAE 451, and ENAE 371. Measurement philosophy, data analysis, error assessment, sensing devices, optical methods, material tests, flow visualization techniques, manometry, dynamic response of measurement systems. Application of instrumentation in aerospace technology.

ENAE 345 Flight Dynamics (3) Prerequisites: ENES 221 and MATH 246. Kinematics and concept of system state. Dynamic principles applied to particles, discrete mass and continuously distributed mass systems, LaGrangian dynamics, dynamic stability of systems, applications to dynamics of aerospace vehicles and vehicle components.

ENAE 355 Aircraft Vibrations (3) Prerequisite: ENAE 345 or equivalent. Free and forced vibration of single and multiple degree of freedom systems.

ENAE 371 Aerodynamics I (3) Prerequisites: ENAE 202, PHYS 262, MATH 241 and concurrent registration in MATH 246. Basic fluid mechanics and aerodynamic theory.

ENAE 398 Honors Research Project (1-3)

ENAE 401 Aerospace Laboratory II (2) Prerequisites: ENAE 305 and ENAE 345. Corequisites: ENAE 452 and ENAE 471. Application of fundamental measurement techniques to experiments in aerospace engineering, structural, aerodynamic, and propulsion tests, correlation of theory with experimental results.

ENAE 402 Aerospace Laboratory III (1) Prerequisites: ENAE 305 and ENAE 345. Corequisites: ENAE 452, ENAE 471, and ENAE 475. Application of fundamental measurement techniques to experiments in aerospace engineering, structural, aerodynamic, flight simulation, and heat transfer tests. Correlation of theory with experimental results.

ENAE 411 Aircraft Design (3) Prerequisites: ENAE 345, ENAE 451, and ENAE 371. Theory, background and methods of airplane design, subsonic and supersonic.

ENAE 412 Design of Aerospace Vehicles (3) Prerequisites: ENAE 345 and ENAE 371. Theory, background and methods of space vehicle design for manned orbiting vehicles, manned lunar and planetary landing systems.

ENAE 415 Computer-aided Structural Design Analysis (3) Prerequisite: ENAE 452 or consent of instructor. Introduction to structural design concepts and analysis techniques. Introduction to computer software for structural analysis which is utilized to verify exact solutions and perform parametric design studies of aerospace structures. Not open to students who have earned credit in ENAE 431.

ENAE 445 Stability and Control of Aerospace Vehicles (3) Prerequisite: ENAE 345 and ENAE 371. Stability, control and miscellaneous topics in dynamics.

ENAE 451 Flight Structures I: Introduction to Solid Mechanics (4) Prerequisite: ENES 220. An introduction to the analysis of aircraft structural members. Introduction to theory of of elasticity, mechanical behavior of materials, thermal effects, finite-difference approximations, virtual work, variational and energy principles for static systems.

ENAE 452 Flight Structures II: Structural Elements (3) Prerequisite: ENAE 451. Application of variational and energy principles to analysis of elastic bodies, stresses and deflections of beams including effects of non-principal axes, non-homogeneity, and thermal gradients, differential equations of beams, bars, and cables. Stresses and deflections of torsional members, stresses due to shear. Deflection analysis of structures.

ENAE 453 Matrix Methods in Computational Mechanics (3) Prerequisite: ENAE 452 or consent of instructor. Introduction to the concepts of computational analysis of continuous media by use of matrix methods. Foundation for use of finite elements in any field of continuum mechanics, with emphasis on the use of the displacement method to solve thermal and structural problems.

ENAE 457 Flight Structures III (3) Prerequisite: ENAE 452 or equivalent. An advanced undergraduate course dealing with the theory and analysis of the structures of flight vehicles. Stresses due to shear, indeterminate structures, plate theory, buckling and failure of columns and plates.

ENAE 461 Flight Propulsion I (3) Prerequisites: ENME 216 and ENAE 471. Operating principles of piston, turbojet, turboprop, ramjet and rocket engines, thermodynamic cycle analysis and engine performance, aerothermochemistry of combustion, fuels, and propellants.

ENAE 462 Flight Propulsion II (3) Prerequisite: ENAE 461. Advanced and current topics in flight propulsion.

ENAE 471 Aerodynamics II (3) Prerequisite: ENAE 371 and ENME 216. Elements of compressible flow with applications to aerospace engineering problems.

ENAE 472 Aerodynamics III (3) Prerequisite: ENAE 371. Theory of the flow of an incompressible fluid.

ENAE 473 Aerodynamics of High-Speed Flight (3) Prerequisite: ENAE 472 or equivalent. An advanced course dealing with aerodynamic problems of flight at supersonic and hypersonic velocities. Unified hypersonic and supersonic small disturbance theories, real gas effects, aerodynamic heating and mass transfer with applications to hypersonic flight and re-entry.

ENAE 475 Viscous Flow and Aerodynamic Heating (3) Prerequisites: ENAE 371, ENAE 471, and ENME 216. Fundamental aspects of viscous flow, Navier-Stokes equations, similarity, boundary layer equations, laminar, transitional and turbulent incompressible flows on airfoils, thermal boundary layers and convective heat transfer; conduction through solids, introduction to radiative heat transfer.

ENAE 488 Topics in Aerospace Engineering (1-4) Technical elective taken with the permission of the student's advisor and instructor. Lecture and conference courses designed to extend the student's understanding of aerospace engineering. Current topics are emphasized.

ENAE 499 Elective Research (1-3) May be repeated to a maximum of three credits. Elective for seniors in aerospace engineering with permission of the student's advisor and the instructor. Original research projects terminating in a a written report.

ENAE 588 Professional Development Topics in Aerospace Engineering (1-3) Prerequisite: permission of the instructor. Current topics in aerospace engineering chosen to provide for the professional development of practicing engineers. May not be credited toward a graduate school degree. Repeatable to a maximum of 3 credits.

ENAE 589 Professional Development Topics in Aerospace Engineering (1-3) Prerequisite: permission of the instructor. Current topics in aerospace engineering chosen to provide for the professional development of practicing engineers. May not credited toward a graduate school degree. Repeatable to a maximum of 3 credits.

ENAG — Engineering Agricultural

ENAG 100 Basic Agricultural Engineering Technology (3) An introduction to the application of engineering concepts. Topics include quantification measurements, mechanical, thermal, fluid and electrical principles and their relationship to biological systems

and materials of agricultural and aquacultural products (for non-engineering majors).

ENAG 200 Introduction to Farm Mechanics (2) One lecture and one laboratory period a week. A study of the hand tools and power equipment and their safe use as it applies to mechanized farms. Principles and practice in arc and gas welding, cold metal and sheet metal work are provided. Also, tool fitting, woodworking, plumbing, blue print reading and use of concrete.

ENAG 232 Water, A Renewable Resource (3) Occurrence and distribution of water. Review of both natural and man-made water resource systems. Basics of water quality and waste water treatment.

ENAG 234 Principles of Erosion and Water Control (1) Introduction to principles of estimating runoff and erosion. Engineering principles necessary to control erosion and runoff from agricultural areas. For non-engineering students.

ENAG 236 Design of Drainage Systems (1) Effect of drainage on crop production and quality. Design of agricultural drainage systems. For non-engineering students.

ENAG 237 Design of Irrigation Systems (1) Principles and practices of agricultural irrigation, including types of irrigation systems, soil water concepts, computing evapotranspiration, irrigation scheduling and design of a sprinkler irrigation system. For non-engineering students.

ENAG 305 Farm Mechanics (2) Two laboratory periods a week, available only to seniors in agricultural education. This course consists of laboratory exercises in practical farm shop and farm equipment maintenance, reoair, and construction projects, and a study of the principles of shop organization and administration.

ENAG 315 Energy: Its Effects On Agriculture and Food (3) Introduction to the current energy problems in agricultural production and food supply. Energy issues, alternate sources of energy, energy conservation practices, possible solutions and limitations.

ENAG 401 Agricultural Production Equipment (3) Two lectures and one laboratory per week. Prerequisite: ENAG 100. Principles of operation and functions of power and machinery units as related to tillage, cutting, conveying, and separating units, and control mechanisms. Principles of internal combustion engines and power unit components.

ENAG 402 Agricultural Materials Handling and Environmental Control (3) Two lectures and one laboratory per week. Prerequisite: ENAG 100. Characteristics of construction materials and details of agricultural structures. Fundamentals of electricity, electrical circuits, and electrical controls. Materials handling and environmental requirements of farm products and animals.

ENAG 414 Mechanics of Food Processing (4) Three lectures and one laboratory per week. Prerequisite: PHYS 121. Applications in the processing and preservation of foods, of power transmission, hydraulics, electricity, thermodynamics, refrigeration, instruments and controls, materials handling and time and motion analysis.

ENAG 421 Power Systems (3) Two lectures and one two hour laboratory per week. Prerequisites ENME 217, ENEE 300 and ENME 342 or ENCE 330. Analysis of energy conversion devices including internal combustion engines, electrical and hydraulic motors. Fundamentals of power transmission and coordination of power sources with methods of power transmission.

ENAG 422 Soil and Water Engineering (3) Three lectures per week. Prerequisite: ENME 342 or ENCE 330. Applications of engineering and soil sciences in erosion control, drainage, irrigation and watershed management. Principles of agricultural hydrology and design of water control and conveyance systems.

ENAG 424 Functional and Environmental Design of Agricultural Structures (3) Two lectures and one hour laboratory per week. Prerequisite: ENAG 454. An analytical approach to the design and planning of functional and environmental requirements of plants and animals in semi- or completely enclosed structures.

ENAG 432 General Hydrology (3) Three lectures per week. Qualitative aspects of basic hydrologic principles pertaining to the properties, distribution and circulation of water as related to public interest in water resources.

ENAG 433 Engineering Hydrology (3) Three lectures per week. Prerequisites: MATH 246, ENCE 330 or ENME 342. Properties, distribution and circulation of water from the sea and in the atmosphere emphasizing movement overland, in channels and through the soil profile. Qualitative and quantitative factors are considered.

ENAG 435 Aquacultural Engineering (3) Prerequisite: consent of department. A study of the engineering aspects of development, utilization and conservation of aquatic systems. Emphasis will be on harvesting and processing aquatic animals or plants as related to other facets of water resources management.

ENAG 444 Functional Design of Machinery and Equipment (3) Two lectures and one two-hour laboratory per week. Prerequisite: ENES 221 and senior standing. Theory and methods of agricultural machine design. Application of machine design principles and physical properties of soils and agricultural products in designing machines to perform specific tasks.

ENAG 454 Biological Process Engineering (4) Prerequisite: ENME 342 or ENCE 330. Design of systems to pump, heat, cool, dry and control biological materials as part of food and agricultural engineering. The effect of physical parameters on biological material response to these processes.

ENAG 488 Topics in Agricultural Engineering Technology (1-3) Prerequisite: permission of the instructor. Selected topics in agricultural engineering technology of current need and interest. May be repeated to a maximum of six credits if topics are different. Not acceptable for credit towards major in agricultural engineering.

ENAG 489 Special Problems in Agricultural Engineering (1-3) Prerequisite: approval of department. Student will select an engineering problem and prepare a technical report. The problem may include design, experimentation, and/or data analysis.

ENAG 499 Special Problems in Agricultural Engineering Technology (1-3) Prerequisite: approval of department. Not acceptable for majors in agricultural engineering. Problems assigned in proportion to credit.

ENCE — Engineering, Civil

ENCE 221 Introduction to Environmental Engineering (3) Prerequisite: CHEM 103 and PHYS 161. An introductory exposition of those physical, chemical, and biological systems relating to the quality of the land, water, and air environments. Current environmental pollution problems and methods of pollution abatement.

ENCE 280 Engineering Survey Measurements (3) Two lectures and one laboratory per week. Prerequisite: MATH 141. Standards,units, calibration,measurement of distance, elevation, angles, systematic and random error analysis in measurements, fundamentals of mapping, instrumentation.

ENCE 300 Fundamentals of Engineering Materials (3) Two lectures and one laboratory per week. Prerequisite: ENES 220 or concurrent registration. Properties and constitution of the principal materials used in civil engineering. Laboratory tests for these properties, interpretation of test results and of specifications.

ENCE 330 Basic Fluid Mechanics (3) Prerequisite: ENES 220, 221, PHYS 262. The study of fluids at rest and in motion. Principles of viscous and turbulent flow. Impulse and momentum concepts. Pumps, turbines and meters. Dimensional analysis and laws of similarity.

ENCE 340 Fundamentals of Soil Mechanics (3) Prerequisite: ENES 220 and ENCE 300. Introductory study of soils in civil engineering. Soil origin, phase relationships and classification schemes. Soil hydraulics: capillary, effective stress, permeability and seepage considerations. Basic stress distribution theories and soil consolidation-settlement analysis. Integration of shear strength evaluation with slope stability analysis.

ENCE 350 Structural Analysis and Design I (3) Prerequisites: ENES 220 and concurrent registration in ENCE 300. Methods of analysis of statically determinate structures for fixed and moving loads. Equilibrium, influence lines, stability. Structural design of steel buildings and bridges, including design of tension members, beams, columns, trusses, and welded, bolted, and riveted connections.

ENCE 351 Structural Analysis and Design II (3) Prerequisites: ENCE 300 and ENCE 350. Analyses for stresses in statically indeterminate beams and frames by approximate methods and by moment distribution. Influence lines and maximum shear and moment for continuous members. Design of reinforced concrete beams, continuous beams, and columns by elastic theory and by ultimate strength design.

ENCE 360 Engineering Analysis and Computer Programming (4) Prerequisite: MATH 241. Introduction to the elements of Fortran and the algorithmic approach in the analysis of civil engineering problems. Methods of numerical analysis including the solution of linear systems of equations, numerical quadrature, differentiation, interpolation, and the solution of polynomial and transcendental equations. Instruction in the computer solution of civil engineering problems.

ENCE 370 Fundamentals of Transportation Engineering (3) Prerequisite: ENCE 280. Engineering problems of transportation by airways, highways, pipelines, railways, and waterways. Elementary dynamics of traffic and function consideration of routes and terminals.

ENCE 398 Honors Research Project (1-3)

ENCE 410 Advanced Strength of Materials (3) Prerequisites: ENES 220, ENCE 350 and MATH 246. Strength and deformation of deformable bodies, plane stress and strain. Torsion theory, unsymmetrical bending, curved beams. Behavior of beams, columns, slabs, plates and composite members under load. Elastic and inelastic stability.

ENCE 411 Experimental Stress Analysis (4) Three lectures and one laboratory per week. Prerequisite: ENES 220. Application of experimental data on materials to design problems. Correlation of analytical and experimental methods of analysis with design. Electric strain gages, photoelasticty, brittle laquer methods and various analogies.

ENCE 420 Basic Civil Engineering Planning I (3) Prerequisite: senior standing or consent of the instructio. Urban-regional physical planning from the civil engineering viewpoint. Integration of the planning aspects of engineering, environmental, structural, transportation and water resources into a systems approach to the practice of civil engineering. Also included site, construction, and engineering materials planning, engineering economics and evaluation, current topics.

ENCE 421 Construction Engineering (3) Two lectures and one laboratory per week. Prerequisites: ENCE 340, 351, 370 or consent of instructor. The ordering of engineered construction. Modern techniques of construction planning estimating, scheduling operation, control. Construction methods. Contract and resource management. Systems approach to construction management practice.

ENCE 430 Hydraulic Engineering and Open Channel Flow (4) Three lectures and one laboratory per week. Prerequisite: ENCE 330. Application of basic principles to the solution of engineering problems: ideal fluid flow, mechanics of fluid resistance, open channel flow under uniform, gradually varied and rapidly varied conditions, sediment transport, role of model studies in analysis and design.

ENCE 431 Surface Water Hydrology (3) Prerequisites: ENCE 330 AND 360. Study of the physical processes of the hydrologic cycle. Hydrometeorology, concepts of weather modification, evaporation and transpiration, infiltration studies, runoff computations, flood routing, reservoir requirements, emphasis on process simulation as a tool in the water resource development.

ENCE 432 Ground Water Hydrology (3) Prerequisites: ENCE 330. Concepts related to the development of the ground water resource, hydrogeology, hydrodynamics of flow through porous media, hydraulics of wells, artificial recharge, sea water intrusion, basin-wide ground water development.

ENCE 433 Environmental Engineering Analysis (3) Prerequisites: CHEM 113 and ENCE 221. Two lectures and one laboratory per week. The theory and analytical techniques used in evaluating man's environment. Emphasis on quantitative physical electroanalytical and organic chemistry as applied to chemical analysis of water.

ENCE 434 Air Pollution (3) Classification of atmospheric pollutants and their effects on visibility, inanimate and animate receptors. Evaluation of source

emissions and principles of air pollution control, meteorological factors governing the distribution and removal of air pollutants, air quality measurements and air pollution control legislation

ENCE 435 Sanitary Engineering Analysis and Design (4) Three lectures and one laboratory per week. Prerequisite: ENCE 221 and ENCE 330. The application of sanitary analysis and fundamental principles to the design and operation of water and waste water treatment plants and the control of stream pollution

ENCE 440 Engineering Soil Tests (4) Prerequisite: ENCE 340. Two lectures and two laboratory sessions per week. Review of major soil tests and their interpretation for engineering purposes. Engineering classification tests (Atterberg limits, grain-size distribution, specific gravity), permeability and seepage properties, in-situ and lab density-moisture tests, soil strength (penetrometers, vane shear, CBR, unconfined compression, direct shear and triaxial) and compressibility characteristics.

ENCE 441 Soil-Foundation Systems (3) Prerequisite: ENCE 340. Review of classical lateral earth pressure theories, analysis of braced excavation systems, cantilever and anchored sheet piling design, bearing capacity of shallow foundations (footings and mats) design of deep pile foundations to include pile capacity and pile group action.

ENCE 442 Highway and Airfield Pavement Design (3) Prerequisite: ENCE 340. Principles relative to the design, construction and rehabilitation of highway and airfield pavement systems. Introduction to multi-layered elastic and slab theories, properties of pavement materials and methods of characterization, stochastic treatment of design variables, economic principles of design alternates and the effect of environment upon pavement performance. Review of existing rigid and flexible design methods as well as major fundamentals relative to the rehabilitation of existing pavement systems.

ENCE 450 Design of Steel Structures (3) Pre- or corequisite: ENCE 360 and ENCE 351. Analyses for stresses and deflections in structures by methods of consistent deformations, virtual work and internal strain energy. Application to design of plate girders, indeterminate and continuous trusses, two hinged arches and other structures. Elements of plastic analysis and design of steel structures.

ENCE 451 Design of Concrete Structures (4) Prerequisites: ENCE 351 and pre- or corequisite ENCE 360. Three lecture hours and one laboratory per week. Design of reinforced concrete structures, including slabs, footings, composite members, building frames, and retaining walls. Approximate methods of analysis; code requirements; influence of concrete properties on strength and deflection; optimum design. Introduction to prestressed concrete design.

ENCE 460 Modern Techniques For Structural Analysis (3) Prerequisite: ENCE 360 and pre- or corequisite: ENCE 351. Two lecture hours and one laboratory per week. Application of computer oriented methods and numerical techniques to analysis and design of structural systems. Matrix formulation of the stiffness and flexibility methods for framed structures. Introduction of numerical techniques to the solution of selected problems in such topics as plates, structural stability, and vibrations.

ENCE 461 Analysis of Civil Engineering Systems I (3) Prerequisite: consent of department. Application of the principles of engineering economy and statistics to the solution of civil engineering problems. Economic comparison of alternatives using present worth, annual cost, rate of return and cost benefit analyses. Development and use of simple and multiple regression models, and statistical decision theory.

ENCE 463 Engineering Economics and System Analysis (3) Prerequisite: consent of department. Development and application of the principles of engineering economics to problems in civil engineering. Evaluation of design alternatives, depreciation and sensitivity analysis. Use of systems analysis techniques, including CPM, PERT and decision networks. Introduction to microeconomic analysis.

ENCE 470 Highway Engineering (4) Three lectures and one three-hour laboratory per week. Prerequisite: ENCE 340. Location, design, construction and maintenance of roads and pavements. Introduction to traffic engineering.

ENCE 473 Air and Water Transportation Engineering (3) Prerequisite: ENCE 370. Detailed study of the planning, design, construction, operations and maintenance of airports and waterways, emphasis on design and operations of transportation facilities.

ENCE 474 Railroad Mass Transportation Engineering (3) Prerequisite: ENCE 370. Detailed study of the planning, design, construction, operations, and maintenance of railroads and mass transportation systems, emphasis on design and operations of transportation facilities.

ENCE 489 Special Problems (3) Prerequisite: senior standing. A course arranged to meet the needs of exceptionally well prepared students for study in a particular field of civil engineering.

ENCH — Engineering, Chemical

ENCH 215 Chemical Engineering Analysis (3) Prerequisite: CHEM 104. Pre- or corequisite: MATH 141. Introduction to methods of chemical engineering calculations and analysis. Stoichiometric relations, material and energy balances, and behavior of gases, vapors, liquids and solids. Analytical and computer methods.

ENCH 280 Transport Processes I: Fluid Mechanics (2) Pre- or corequisite: fluid properties, fluid statics, flow concepts and basic equations, viscous effects. Applications in measurement of flow, closed conduit flow, packe bed and other chemical engineering systems. Not open to students who already have credit for ENCH 250.

ENCH 300 Chemical Process Thermodynamics (3) Prerequisites: CHEM 203, ENCH 215, MATH 241. Principles of thermodynamics and their application to engineering problems. First and second laws of thermodynamics, properties of gases, liquids and solids, phase equilibrium, flow and non-flow systems, energy conversion, production of work from heat, thermodynamic analysis of processes, equilibrium stage operations and the thermodynamics of chemically reaction systems.

ENCH 333 Chemical Engineering Seminar (1) Prerequisite: senior standing. Oral and written reports on recent developments in chemical engineering and the process industries.

ENCH 398 Honors Research Project (1-3)

ENCH 425 Transport Processes II: Heat Transfer (3) Prerequisite: MATH 246. Pre- or corequisite: ENCH 280. Steady and unsteady state conduction, convective heat transfer, radiation, design of condensers, heat exchangers, evaporators, and other types of heat transfer equipment.

ENCH 427 Transport Processes III: Mass Transfer (3) Prerequisite: ENCH 425. Steady and unsteady state molecular diffusion, inter-phase transfer, simultaneous heat and mass transfer, boundary layer theory, mass transfer and chemical reaction. Design applications in humidification, gas absorption, distillation, extraction, adsorption and ion exchange.

ENCH 437 Chemical Engineering Laboratory (3) Prerequisites: ENCH 427, ENCH 440, ENCH 442. Application of chemical engineering process and unit operation principles in small scale semi-commercial equipment. Data from experimental observations are used to evaluate performance and efficiency of operations. Emphasis on correct presentation of results in report form.

ENCH 440 Chemical Engineering Kinetics (3) Prerequisites: ENCH 300, ENCH 325, CHEM 481. Fundamental of chemical reaction kinetics and their application to the design and operation of chemical reactors. Reaction rate theory, homogeneous reactions and catalysis electrochemical reactions. Catalytic reactor design.

ENCH 442 Chemical Engineering Systems Analysis (3) Prerequisites: ENCH 300, ENCH 425. Dynamic response applied to process systems. Goals and modes of control, Laplace transformations, analysis and synthesis of simple control systems, closed loop response, dynamic testing.

ENCH 444 Proocss Engineering Economics and Design I (3) Prerequisites: ENCH 427, ENCH 440, ENCH 442. Principles of chemical engineering economics and process design. Emphasis on equipment types, equipment design principles, capital cost estimation, operating costs, and profitability.

ENCH 445 Process Engineering and Design (3) Prerequisite: ENCH 427. Utilization of chemical engineering principles for the design of process equipment. Typical problems in the design of chemical plants. Comprehensive reports are required.

ENCH 446 Process Engineering Economics and Design II (3) Prerequisite: ENCH 444. Application of chemical engineering principles for the design of chemical processing equipment. Typical problems in the design of chemical plants. Not open to students who already have credit for ENCH 445.

ENCH 450 Chemical Process Development (3) Prerequisite: ENCH 427. Chemical process industries from the the standpoint of technology, raw materials, products and processing equipment. Operations of major chemical processes and industries combined with quantitative analysis of process requirements and yields.

ENCH 452 Advanced Chemical Engineering Analysis (3) Prerequisite: ENCH 427. Application of digital and analog computers to chemical engineering problems. Numerical methods, programming, differential equations, curve fitting, amplifiers and analog circuits.

ENCH 453 Applied Mathematics in Chemical Engineering (3) Prerequisite: ENCH 427. Mathematical techniques applied to the analysis and solution of chemical engineering problems. Use of differentiation, integration, differential equations, partial differential equations and integral transforms. Application of infinite series, numerical and statistical methods.

ENCH 454 Chemical Process Analysis and Optimization (3) Prerequisites: ENCH 427, 440. Applications of mathematical model's to the analysis and optimization of chemical processes. Models based on transport, chemical kinetics and other chemical engineering principles will be employed. Emphasis on evaluation of process alternatives.

ENCH 455 Chemical Process Laboratory (3) Prerequisite: ENCH 427 and 440. One lecture and six hours of laboratory per week. Experimental study of various chemical processes through laboratory and small semi-commercial scale equipment. Reaction kinetics, fluid mechanics, heat and mass transfer.

ENCH 461 Control of Air Pollution Sources (3) Prerequisite: Senior standing in engineering or consent of instructor. Theory and application of methods for the control and removal of airborne materials. Principles of design and performance of air quality control equipment.

ENCH 468 Research (1-3) Prerequisite: Permission of the instructor. Investigation of a research project under the direction of a faculty member. Comprehensive reports are required. Repeatable to a maximum of six credits.

ENCH 475 Electrochemical Engineering (3) Prerequisite: ENCH 425. Fundamentals of electrochemistry with application to engineering and commercial processes. Equilibrium potentials, reaction mechanisms, cell kinetics, polarization, surface phenomena. Electrorefining, electrowinning, oxidation and reduction, solid, liquid and gas systems. Aspects of design and performance of electroprocess plants.

ENCH 480 Engineering Analysis of Physiological Systems (3) Engineering description and analysis of physiological systems. Survey of bioengineering literature and an introduction to mathematical modeling of physiological systems.

ENCH 482 Biochemical Engineering (3) Prerequisite: Senior standing in engineering or consent of instructor. Introduction to biochemical and microbiological applications to commerical and engineering processes, including industrial fermentation, enzymology, ultrafiltration, food and pharmaceutical processing and resulting waste treatment. Enzyme kinetics, cell growth, energetics and mass transfer.

ENCH 485 Biochemical Engineering Laboratory (2) Prerequisite or co-requisite: ENCH 482. Techniques of measuring pertinent parameters in fermentation reactors, quantification of production vanables for primary and secondary metabolites such as enzymes and antibiotics, the insolubilization of enzymes for reactors, and the demonstration of separation techniques such as ultrafiltration and affinity chromatography.

ENCH 490 Introduction to Polymer Science (3) Prerequisite: ENCH 425. The elements of the chemistry, physics, processing methods, and engineering applications of polymers.

ENCH 492 Applied Physical Chemistry of Polymers (3) Prerequisite: CHEM 481 Corequisite: CHEM 482 or consent of instructor. Kinetics of formation of high polymers, determination of molecular weight and structure, and applied thermodynamics and phase equilibria of polymer solutions.

ENCH 494 Polymer Technology Laboratory (3) Prerequisite: ENCH 490 or 492. One lecture and two laboratory periods per week. Measurement of mechanical, electrical, optical, thermal properties of polymers, measurement of molecular weight by viscosimetry isometric and light scattering methods. Application of X-ray, NMR, ESR, spectroscopy molecular relaxation, microscopy and electron microscopy to the determination of polymer structure, effects of ultraviolet light and high energy radiation.

ENCH 495 Rheology of Polymer Materials (3) Prerequisite - ENCH 490 or 492. Mechanical behavior with emphasis on the continuum point of view and its relationship to structural types. Elasticity, viscoelasticity, anelasticity and plasticity of single phase and multiphase materials. Students who have credit for ENCH 495 may not take ENMA 495 for credit.

ENCH 496 Processing of Polymer Materials (3) Prerequisite: ENCH 490 or 492. A comprehensive analysis of the operations carried out on polymeric materials to increase their utility. Conversion operations such as molding extrusion, blending, film forming, and calendering. Development of engineering skills required to practice in the high polymer industry. Students who have credit for ENCH 496 may not take ENMA 496 for credit.

ENCO — Engineering, Cooperative Education

ENCO 408 Co-op Internship (0) Professional internship in industry or government agency provides the practical work experiences which supplement and enhance the theories, principles and practices in the normal educational program. The student should register for ENCO 408 for each summer internship. He should register for both ENCO 408 and ENCO 409 for each semester internship.

ENCO 409 Co-op Internship (0) Professional internship in industry or government agency provides the practical work experiences which supplement and enhance the theories, principles and practices studied in the normal educational program. The student should register for ENCO 408 for each summer internship. He should register for both ENCO 408 and 409 for each summer internship.

ENEE — Engineering, Electrical

ENEE 204 Systems and Circuits I (3) Prerequisite: MATH 141. Required of sophomores in electrical engineering. Kirchhoff's laws, linear, nonlinear, and time-varying elements of systems and circuits. Solution of circuit differential equations, zero input, zero state, and complete response. Coupled elements, ideal transformers, controlled sources. Node and mesh analysis in the time domain.

ENEE 250 Computer Structures (3) Prerequisites: ENEE 240 or equivalent. Basic structure and organization of digital computers, number systems and data representation, assembly language (some simple assembly language programs will be run), introduction to system software, gates and memory elements, logic design of simple digital systems, reliability, hardware/software tradeoffs.

ENEE 300 Principles of Electrical Engineering (3) Prerequisites: MATH 241, PHYS 263 Corequisite: ENEE 301 Required of aerospace, mechanical and chemical engineers. Not applicable in the electrical engineering major program. Acceptable as prerequisite for some advanced ENEE courses. Analysis of linear systems, introduction to Laplace transforms, steady-state A-C transforms, introduction to the concepts of electromagnetic fields and electric machines.

ENEE 301 Electrical Engineering Laboratory (1) Two hours of laboratory per week. Corequisite: ENEE 300. Experiments on the transient and steady-state response of linear circuits, electric machines, electron tubes and semiconductor devices.

ENEE 304 Systems and Circuits II (3) Prerequisite: ENEE 204, pre- or corequisite: MATH 246. Sinusoidal analysis. General mesh and node analysis. Analysis by laplace transforms, network functions, network theorems. Two-port theory, controlled sources, small-signal analysis of semiconductor devices. Fourier series.

ENEE 305 Fundamental Laboratory (2) One lecture and three lab Lhurs per week. Prerequisite: ENEE 204. Concepts and techniques of physical measurements using standard electrical measuring devices generators, oscilloscopes, voltmeters, etc. Measurements of linear and non-linear circuits, steady state and step response, integrated circuits. Handling and use of data.

ENEE 314 Electronic Circuits (3) Prerequisite: ENEE 304 Characteristics of semi-conductor devices. Diodes; biasing and stabilization of bipolar and field effect transistors, power amplifier characteristics. Feedback amplifiers, integrated operational amplifiers; transistor switches, gates, and integrated logic circuits, bistable multivibrators and applications in counters, registers and selected digital networks.

ENEE 322 Signal and System Theory (3) Prerequisites: ENEE 204 and MATH 246. Concept of linear systems, state space equations for continuous and discrete systems, time domain analysis of linear systems. Fourier, Laplace and Z transforms. Application of theory to problems in electrical engineering.

ENEE 324 Engineering Probability (3) Prerequisite: ENEE 322 Axioms of probability, conditional probability and Bayes' rules; random variables, probability distribution and densities; functions of random variables; weak law of large numbers and central limit theorem. Introduction to random processes, correlation functions, spectral densities, and linear systems. Applications to noise in electrical systems, filtering of signals from noise, estimation, and digital communications.

ENEE 380 Electromagnetic Theory (3) Prerequisites: MATH 241 and PHYS 263. Introduction to electromagnetic fields. Coulomb's law, Gauss's law, electrical potential, dielectric materials capacitance, boundary value problems, Biot-Savart law, Ampere's law, Lorentz force equation, magnetic materials, magnetic circuits, inductance, time varying fields and Maxwell's equations.

ENEE 381 Electromagnetic Wave Propagation (3) Prerequisite: ENEE 380. Review of Maxwell's equations, the wave equation, potentials, Poynting's theorem. Transmission, lossy medium, skin effect. Parallel-plate and rectangular wave-guides. Radiation, retarded potentials, radiation from dipole.

ENEE 398 Honors Research Project (1-3)

ENEE 400 Computer Aided Circuit Analysis (3) Prerequisite: ENEE 314 Computer aided analysis of electronic devices and components. Network topology, computer formulation of Kirchhoff laws, nodal analysis of linear and non-linear networks, computer formulation of the state equations, time domain and frequency domain solution, sensitivity calculations.

ENEE 407 Microwave-circuits Laboratory (2) Prerequisite: Senior standing in electrical engineering or consent of instructor. One lecture and three lab hours per week. Experiments concerned with circuits constructed from microwave components providing practical experience in the design, construction and testing of such circuits. Projects include microwave filters and S-parameter design with applications of current technology.

ENEE 410 Electronic Circuits (3) Prerequisite: ENEE 300 or equivalent knowledge of circuit theory or consent of the instructor. This course is intended for students in the physical sciences, and for engineering students requiring additional study of electron circuits. Credit not normally given for this course in an electrical engineering major program. (ENEE 413 may optionally be taken as an associated laboratory). P-n junctions, transistors, vacuum tubes, biasing and operating point stability, switches, large-signal analysis, models, small-signal analysis, frequency response feedback and multistage amplifiers, pulse and digital circuits.

ENEE 412 Advanced Electronics (3) Prerequisite: ENEE 314. Design and analysis of tuned circuits, oscillators, VCO's phase-locked loops, multipliers, modulators and A/D converters and their application in telemetry, communication and instrumentation.

ENEE 413 Electronics Laboratory (2) One lecture and three laboratory hours per week. Prerequisite: ENEE 314. The specification, design and testing of basic electronic circuits and practical interconnections. Emphasis on design with discrete solid state and integrated circuit components for both analog and digital circuits.

ENEE 414 Network Analysis (3) Prerequisite: ENEE 304. Network properties linearity, reciprocity, etc., 2-Port descriptions and generalization. Y, S, hybird matrices, description properties symmetry para-unity, etc., basic topological analysis, state-space techniques; computer-aided analysis, sensitivity analysis, approximation theory.

ENEE 416 Network Synthesis (3) Prerequisite: ENEE 304. Active and passive components, passivity, bounded and positive real, RC properties and synthesis, Brune and Darlington synthesis, transfer-voltage and Y21 synthesis, active feedback configurations, image parameter design, computer-aided optimization synthesis via the embedding concept.

ENEE 418 Projects in Electrical Engineering (1-3) Hours to be arranged. Prerequisites: Senior standing and permission of the instructor. May be taken for repeated credit up to a total of 4 credits, with the permission of the student's advisor and the instructor. Theoretical and experimental projects.

ENEE 419 Apprenticeship in Electrical Engineering (2-3) Hours to be arranged. Prerequisite: completion of sophomore courses and permission of an apprenticeship director. May be taken for repeated credit up to a total of nine credits. A unique opportunity for experience in experimental research and engineering design. A few highly qualified students will be selected as apprentices in one of the research facilities of the electrical engineering department and will participate in the current research under the supervision of the laboratory director. In the past, apprenticeships have been available in the following laboratories: biomedical, electron ring accelerator, gas laser, integrated circuits, simulation and computer, and solid state laser.

ENEE 420 Communication Systems (3) Prerequisite: ENEE 324 Fourier series, Fourier transforms and linear system analysis; random signals, autocorrelation functions and power spectral densities, analog communication systems: amplitude modulation, single-sideband modulation, frequency and phase modulation, sampling theorem and pulse-amplitude modulation; digital communication systems: pulse-code modulation, phase-shift keying, differential phase shift keying, frequency shift keying, performance of analog and digital communication systems in the presence of noise.

ENEE 421 Information Theory and Coding (3) Prerequisite: ENEE 324 Definition of information and entropy, Memoryless and Markov sources: source coding, Kraft and MacMillan inequalities, Shannon's first theorem, Hoffman Codes. Channels, Mutual Information, and Capacity. Shannon's Noisy Channel Coding Theorem, Error Correcting Codes.

ENEE 425 Digital Signal Processing (3) Prerequisite: ENEE 322. Sampling as a modulation process, aliasing, the sampling theorem, the Z-transform and discrete-time system analysis, direct and computer-aided design of recursive and nonrecursive digital filters, the Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), digital filtering using the FFT, analog-to-digital and digital-to analog conversion, effects of quantization and finite-word-length arithmetic.

ENEE 426 Communication Networks (3) Prerequisite: Consent of department. The main design issues associated with ordinary single-user, point-to-point communication systems and their juxtaposition to those involved in multi-user systems such as computer networks, satellite systems, radio nets, and general communication networks. Application of analytical tools of queueing theory to design problems in such networks. Review of proposed architectures and protocols.

ENEE 434 Introduction to Neural Networks and Signals (3) Prerequisite: ENEE 204 or 300. Introduction in the generation and processing of bioelectric signals including structure and function of the neuron, membrane theory, generation and propagation of nerve impulses, synaptic mechanisms, transduction and neural coding of sensory events, central nervous system

processing of sensory information and correlated electrical signals; control of effector organs muscle contraction and mechanics, and models of neurons and neural networks.

ENEE 435 Electrodes and Electrical Processes in Biology and Medicine (3) Prerequisite: ENEE 204 or 300. Techniques for recording biological signals such as brain, muscle and cardial electrical potentials, membrane theory, half-cell potentials, liquid junction potentials, polarization of electrodes, biological and medical instrumentation, and applications in the design of cardial pacemakers, or a similar case study.

ENEE 438 Topics in Biomedical Engineering (1-3) Prerequisite: Permission of the instructor. May be taken for repeated credit. The content may vary from semester to semester. Selected topics of current interest from such areas as bioelectric systems, modeling instrumentation, automated diagnostic, health-care delivery, etc. Repeatable to a maximum of 9 hours.

ENEE 440 Microprocessors (3) Prerequisite: ENEE250. Microprocessor architectures, instruction sets, assembly language programming, memory organization, I/O interfacing (programmed, DMA, interrupt), special interfaces, (A/D and D/A converters, keyboard, display, floppy disc, etc.).

ENEE 442 Software Engineering (3) Prerequisites: ENES 240; ENEE 250 or equivalent. Architectural aspects of software engineering. Machine language and machine structure, assembly language and assemblers; macro-language and macro-processors; loaders and linkers, programming languages and language structure; compilers and interpreters, operating systems.

ENEE 444 Logic Design of Digital Systems (3) Prerequisite: ENEE 250. Review of switching algebra; gates and logic modules, map simplification techniques; multiple-output systems; memory elements and sequential systems, large switching systems; iterative networks; sample designs, computer oriented simplification algorithms, state assignment; partition techniques, sequential system decompositions.

ENEE 445 Computer Laboratory (2) Prerequisite: ENEE 444. One lecture and three lab hours per week. Hardware oriented experiments providing practical experience in the design, construction, and checkout of components and interfaces for digital computers and data transmission systems. Projects include classical design techniques and applications of current technology.

ENEE 446 Digital Computer Design (3) Prerequisite: ENEE 250. Essential elements of the hardware design of digital computers. Arithmetic and logic units, adders, multipliers, dividers, logic and shifting operations, floating point arithmetic. Memory organization, design of a basic computer, instruction set, bus structure, fetch-execute microoperations, hard-wired control unit, microprogrammed control unit, index registers, indirect addressing, interrupt operation, direct memory access. Organization of commercially available computers. No student will be allowed credit for both CMSC 410 and ENEE 446.

ENEE 450 Discrete Structures (3) Prerequisite: ENES 240 or equivalent. Review of set algebra including relations, partial ordering and mappings. Algebraic structures including semigroups and groups. Graph theory including trees and weighted graphs. Boolean algebra and propositional logic. Applications of these structures to various areas of computer engineering.

ENEE 460 Control Systems (3) Prerequisite: ENEE 322. Mathematical models for control system components. Transform and time domain methods for linear control systems. Introductory stability theory. Root locus. Bode diagrams and Nyquist plots. Design specifications in the time and frequency domains. Compensation design in the time and frequency domain. Introduction to sampled data systems. Introduction to computer aided design of control systems.

ENEE 461 Control Systems Laboratory (2) Prerequisite: ENEE 460. One lecture and three lab hours per week. Projects to enhance the student's understanding of feedback control systems and to familiarize him with the characteristics and limitations of real control devices. Students will design, build, and test servomechanisms, and will conduct analog and hybrid computer simulations of control systems.

ENEE 462 Systems, Control and Computation (3) Prerequisites: ENEE 300 or 304 and MATH 246 or consent of instructor. Matrix algebra; state space analysis of discrete systems; state space analysis of continuous systems; computer algorithms for circuit analysis, optimization and system simulation.

ENEE 472 Transducers and Electrical Machinery (3) Prerequisite: ENEE 304. Electromechanical transducers, theory of electromechanical systems, power and wideband transformers, rotating electrical machinery from the theoretical and performance points of view.

ENEE 473 Transducers and Electrical Machinery Laboratory (1) Corequisite: ENEE 472. Experiments on transformers, synchronous machines, induction motors, synchros, loudspeakers, other transducers.

ENEE 480 Fundamentals of Solid State Electronics (3) Prerequisite: ENEE 381. Review of Maxwell's equation, electromagnetic properties of dielectrics; introduction to quantum mechanics and quantum statistics, classical and quantum theory of metals, theory of semiconductors and semiconductor devices, principle of magnetic devices and selected topics.

ENEE 481 Antennas (3) Prerequisite: ENEE 381. Introduction to the concepts of radiation, generalized far field formulas, antenna theorems and fundamentals; antenna arrays, linear and planar arrays; aperture antennas, terminal impedance, propagation.

ENEE 483 Electromagnetic Measurements Laboratory (2) Prerequisites: ENEE 305 and ENEE 380. One lecture and three lab hours per week. Experiments designed to provide familiarity with a large class of micro-wave and optical components, techniques for interconnecting them into useful systems, and techniques of high frequency and optical measurements.

ENEE 487 Particle Accelerators, Physical and Engineering Principles (3) Prerequisites: ENEE 380 and PHYS 420, or consent of the instructor. Sources of charged particles, methods of acceleration and focusing of ion beams in electromagnetic fields, basic theory, design, and engineering principles of particle accelerators.

ENEE 488 Topics in Electrical Engineering (3) Prerequisite: permission of the instructor. May be taken for repeated credit up to a total of six credits, with the permission of the student's advisor and the instructor.

ENEE 494 Solid State Devices (3) Prerequisite: ENEE 314. Introduction to semiconductor materials; p-n junctions; metal-semiconductor contacts; bipolar transistors, insulated gate field effect transistors; and related selected topics.

ENEE 495 Integrated Circuit Technology (3) Prerequisite: ENEE 494. Introduction to the fabrication technologies for integrated circuits including oxidation, diffusion, and photolithography ; concepts of bipolar and MOS device design, layout of simple digital ICs.

ENEE 496 Lasers and Electro-optic Devices (3) Pre- or corequisite: ENEE 381. Optical resonators, fabry-perot etalon. Theory of laser oscillation, rate equations. Gaseous, solid state, semiconductor and dye laser systems. Electro-optic effects and parametric oscillators. Holography.

ENES — Engineering Science

ENES 101 Introductory Engineering Science (3) Basic languages of the engineer. Elements of graphic communication and analysis. Orthrographic projection, conventions, graphs and curve-fitting. Introduction to Fortran computer language. Engineering orientation, selection of a major and career goals.

ENES 110 Statics (3) Corequisite: MATH 141. The equilibrium of stationary bodies under the influence of various kinds of forces. Forces, moments, couples, equilibrium, trusses, frames and machines, centroids, moment of inertia, beams, and friction. Vector and scalar methods are used to solve problems.

ENES 120 Noise Pollution (3) An introduction to the sources and the effects of noise pollution in the modern environment. Physical properties of sound and methods of measurement. Noise abatement methods. Public policy approaches to the control of environmental noise.

ENES 121 The Man-Made World (3) Introduction to technology created- to enhance the operation of contemporary society. Study of the conception and operation of technological systems. Examples of systems for transportation, communications, information, and energy supply. Concepts of modeling, feedback and stability applied to the analysis, interpretation and understanding of the behavior of technological systems and their impact on society.

ENES 131 Introduction to Flight (3) An elementary course in aeronautics appropriate for both science and non-science students. The elements of flight as exemplified by the flight of birds and the historical development of the airplane. Navigation and control of the aircraft, weather as it affects aviation, flight instruments, and the operation of the U.S. Civil Aviation System. One hour of flight simulator experience is included.

ENES 220 Mechanics of Materials (3) Prerequisites: MATH 141, PHYS 161 and ENES 110. Distortion of engineering materials in relation to changes in stress or temperature. Geometry of internal strain and external displacement. Application to beams, columns, shafts, tanks, and other structural, machine and vehicle members.

ENES 221 Dynamics (3) Two lectures and one two-hour laboratory per week. Prerequisite: ENES 110. Pre- or corequisite: MATH 241 and PHYS 262. Systems of heavy particles and rigid bodies at rest and in motion. Force-acceleration, work-energy and impulse-momentum relationships. Motion of one body relative to another in a plane and in space.

ENES 230 Introduction to Materials and Their Applications (3) Prerequisite: ENES 110. Structure of materials, chemical composition, phase transformations, corrosion and mechanical properties of metals, ceramics, polymers and related materials. Material selection in engineering applications.

ENES 240 Engineering Computation (3) Two lectures and one two-hour laboratory period per week. Prerequisite: MATH 141. Introduction to the design and implementation of algorithms to solve engineering problems using digital computers. Analysis of problems fundamental to engineering design, construction and diagrammatic description of effective procedures for solving them and implementing and testing of these solutions in a common high-level engineering oriented language such as FORTRAN. Techniques for sata input and storage, selection of relevant numerical and non-numerical methods for problem solutions, and the efficient ordering of data for meaningful output presentation.

ENES 388 Engineering Honors Seminar (1)

ENES 401 Technological Assessment (3) Intended for seniors not majoring in engineering. Not applicable as a technical elective for engineering majors. Analysis of assessing technology in terms of goals and resources. Public and private constraints, changes in objectives and organization. Applications to engineering technology.

ENES 405 Power and the Environment (3) Intended for seniors not majoring in engineering. Not applicable as a technical elective for engineering majors. An introduction to the power needs of society. The interrelationship between man's use of energy and the effect on the eco-system. Introduction to the techniques of power production with special emphasis on nuclear fueled power plants.

ENES 414 Solar Energy Applications in Buildings (3) Prerequisite: PHYS 262 or consent of instructor. Methods of utilizing solar energy to provide heating, cooling, hot water, and electricity for buildings, survey of related techniques for reducing energy consumption in buildings. Solar collectors, heating and cooling systems, water heaters, energy storage, solar cells, solar-thermal power systems. Quantitative evaluation of system efficiencies, economics of solar energy utilization; structural and esthetic integration of solar collectors and system components into building designs.

ENES 473 Principles of Highway and Traffic Engineering (3) Prerequisites: permission of instructor. Designed to assist the non-engineer in understanding highway transportation systems. A survey of the fundamentals of traffic characteristics and operations. Study of the methods and implementation of traffic control and regulation. An examination of highway design procedures, and the role of traffic engineering in transportation systems safety improvements.

ENES 508 Engineering Professional Development (2) Prerequisite: B S in engineering or consent of instructor. Subjects as announced. Review and extension of subject areas covered at the undergraduate level. Preparation for EIT examination, licensing, and other professional requirements. Not applicable towards a graduate degree.

ENFP — Engineering, Fire Protection

ENFP 251 Introduction to Fire Protection Engineering (3) The social, economic, environmental and legal dimensions of the fire problem. The theoretical and engineering principles of basic fire phenomena. Technological assessment of urban fire protection utilizing operations research and systems engineering procedures.

ENFP 290 Fire Protection Fluids (3) Fluid flow principles for fire protection systems. Hydrostatic and hydrodynamic problem associated with water supply systems. Calculation methods, techniques and procedures for hydraulically designed distribution networks to meet prescribed conditions of adequacy and reliability of the total system.

ENFP 310 Fire Protection Systems Design I (3) Prerequisite: ENFP 290. Study of aqueous suppression system agents and their application to selected fire protection problems. Examination of specifications, code criteria, published criteria and research utilized in the engineering design of aqueous agent suppression systems. Application of hydraulic theory to a range of design considerations. Problem calculations based upon student prepared design layouts.

ENFP 315 Fire Protection Systems Design II (3) Prerequisites: ENFP 290 and 310. Study of gaseous and particulate fire suppression systems. Examination and evaluation of code criteria, performance specifications and research. Application of fluid theory to the design process and the calculation procedures for gaseous particulate fire suppression systems. An integrated fire protection systems design project. Functional analysis and design of detection systems.

ENFP 320 Pyrometrics of Materials (3) Analysis and study of characteristics of materials, and material assemblies related to flame spread, fuel contribution, combustibility and smoke development. Analysis of fuel geometry and configuration to fire severity. Procedures of laboratory analysis, determination and modeling.

ENFP 321 Functional and Life Safety Analysis (3) Prerequisite: ENFP 320. Corequisite: ENFP 315. The function and life safety components of buildings. Analytical concepts and research related to modular loss analysis. The physical and psychological variables of fire casualties with techniques of system analysis. Current research related to egress and smoke movement. Performance criteria of building and fire prevention codes.

ENFP 398 Honors Research Project (1-3)

ENFP 411 Fire Protection Hazard Analysis (3) Prerequisites: ENFP 251 and 315. Appraisal and measurement of fire safety. Application of systems analysis, probability theory, engineering economy, and risk management in the identification and synthesis of components of fire protection engineering. Methods for the development of criteria for the design, evaluation and assessment of fire safety or component hazards.

ENFP 412 Heat Transfer Applications in Fire Protection (3) Prerequisites: CMSC 110, ENES 240; or ENME 320, ENME 217. The principles of heat transfer. Application of the governing equations for conduction, convection and radiation heat transfer to fire protection problems. Analysis of the concepts of combustion with the chemical and physical components. Discussion and study of ignition, propagation and explosion phenomena.

ENFP 416 Problem Synthesis and Design (3) Prerequisite: senior standing. Techniques and procedures of problem orientation and solution design utilizing logical and numerical procedures. Student development of research projects in selected areas.

ENFP 417 Fire Protection Hydraulic Design (3) Prerequisites: ENFP 315, CMSC 110 or ENES 240. Procedures and techniques used to analyze complex fire protection distribution and suppression systems by computer analysis. Examination of existing computer analysis techniques and programs with fire protection design concepts. Student initiated computer design projects.

ENFP 489 Special Topics (3) Prerequisite: permission of the department. Selected topics of current importance of fire protection. Limited to a total of 6 credits.

ENGL — English

ENGL 001 Basic Reading (3) Practice in reading college-level expository texts with a focus on comprehension, vocabulary development, and study skills. Open only to Individual Admit students. The course does not carry credit towards any degree at the University.

ENGL 101 Introduction to Writing (3) An introductory course in expository writing.

ENGL 201 World Literature (3) Homer to the Renaissance, foreign classics being read in translation.

ENGL 202 World Literature (3) Shakespeare to the present, foreign classics being read in translation.

ENGL 205 Introduction to Shakespeare (3) Reading of selected representative plays including the major tragedies. Recommended for non-majors.

ENGL 211 English Literature From the Beginnings to 1800 (3)

ENGL 212 English Literature From 1800 to the Present (3)

ENGL 221 American Literature: Beginning to 1865 (3)

ENGL 222 American Literature: 1865 to Present (3)

ENGL 234 Introduction to Afro-American Literature (3) A survey of Black American literature from the late eighteenth century to the present.

ENGL 240 Introduction to Literary Forms: Fiction, Poetry, Drama (3) Readings in the novel, short story, poetry and drama. Not open to students who have credit for ENGL 102.

ENGL 241 Introduction to the Novel (3)

ENGL 242 Fact and Fiction: Forms of Non-Fictional Prose (3) Contemporary and historical works in some of the major genres of non-fiction: biography, ecology, science writing, editorial, cultural commentary. The purposes of non-fiction (information, persuasion, analysis, and commentary); the research and writing methods of non-fiction writers, and the impact and value of non-fiction works in society.

ENGL 243 Introduction to Poetry (3)

ENGL 244 Introduction to Drama (3) A survey of the basic literature of drama from the classical Greeks to modern times.

ENGL 245 Introduction to Film As Literature (3) Primary attention is on the film as a narrative medium, but other literary models will be examined.

ENGL 246 The Short Story (3)

ENGL 247 Literature of Fantasy (3) Reading and analysis of various works of non-realistic literature broadly termed "fantasy".

ENGL 250 Women in Literature (3) Images of women in literature by and about women.

ENGL 260 Introduction to Folklore (3) History, theory, and genres of folklore. Not open to students who have credit in ENGL 360.

ENGL 270 Introduction to English Honors (3) Intensive study of a limited number of works drawn from five major genres (drama, narrative poetry, lyric poetry, prose fiction, prose non-fiction). An introduction for the beginning honors student to the major genres, literary backgrounds, chronological divisions and methods of approaching English and American literature. Required for graduation with honors.

ENGL 274 Literature for Children (3) Analysis of nineteenth and twentieth century classics of the genre. Relation of this literature to the forming of future literary perceptions.

ENGL 278 Special Topics in Literature (3) Repeatable to a maximum of 9 hours.

ENGL 281 Standard English Grammar, Usage, and Diction (3) The basic structure of written English, including parts of speech, sentence patterns, standard punctuation, diction, and usage.

ENGL 294 Introduction to Creative Writing (3) Additional prerequisite: sophomore standing.

ENGL 300 AND 400 level course prerequisites: any two freshman or sophomore English courses, with the exception of ENGL 293 and ENGL 294.

ENGL 301 Critical Methods in the Study of Literature (3) An introduction to the techniques of literary analysis and a brief survey of the most common approaches to literature. Required of all English and American literature majors.

ENGL 302 English Medieval Literature in Translation (3)

ENGL 304 The Major Works of Shakespeare (3) Students who have credit for ENGL 403 or 404 cannot receive credit for ENGL 304.

ENGL 305 Shakespeare and His Contemporaries: An Introduction (3) An introduction to the plays of Shakespeare and those of several of his contemporaries. The course emphasizes a reading of eight to ten plays in the context of the development of the drama in England and of the pertinent Elizabethan theatrical, social, intellectual, and political circumstances. Because the course includes six of the plays of Shakespeare normally taught in ENGL 405, students who take ENGL 305 may not take ENGL 405. They may take ENGL 403, 404, 450, 451.

ENGL 310 Medieval and Renaissance British Literature (3) A perspective on the cultural attitudes and values that separate the Middle Ages from the Renaissance, highlighting the changing role and purpose of the writer. Major works and authors include Beowulf, Chaucer, Spenser, and Sidney. Not open to students who have credit for ENGL 211 or 212.

ENGL 311 Baroque and Augustan British Literature (3) An intensive study of major works of seventeenth and eighteenth century English literature exploring the variety of artistic ideas and techniques of the period.

ENGL 312 Romantic to Modern British Literature (3) An intensive study of major works of nineteenth and twentieth century English literature.

ENGL 313 American Literature (3) A detailed study of selected major texts of American literature from the 17th to the 20th century, including women's literature, black literature, and literature from various regions of the century. Not open to students who have credit for ENGL 221 or 222.

ENGL 345 Twentieth Century Poetry (3) A one-semester survey course in British and American poetry from Yeats and Robinson to the present. Special emphasis on Yeats, Pound, Eliot, Williams, Roethke, and Lowell. Not open to students who already have credit for ENGL 445 or 446.

ENGL 348 Literary Works By Women (3) The context, form, style and meaning of literary works by women. Repeatable to a maximum of six credits when content differs.

ENGL 361 Medieval Literary Modes and Modern Narrative (3) Literary patterns characteristic of medieval myth, epic, and romance, their continuing vitality in modern works, and links between Medieval works like "The Prose Edda", "Beowulf", "The Morte D'Arthur", "The Volsunga Saga", and "Grettis Saga" and modern narratives like Tolkien's "The Lord of the Rings".

ENGL 369 Honors Seminar: Major Traditions (4-5) Prerequisite: permission of the director of English honors. Intensive study of major English and American literary classics in their generic context of narrative and lyric poetry, drama, prose, fiction and non-fiction from the beginnings to the present.

ENGL 370 Junior Honors Conference (1) Prerequisite: candidacy for honors in English. Preparation for writing the senior honors project.

ENGL 371 Senior Honors Conference (1) Prerequisite: candidacy for honors in English. Presentation and discussion of senior honors projects.

ENGL 373 Honors Thesis (3) Prerequisite: candidacy for honors in English. Research and writing of senior honors project. Strongly recommended for students planning graduate work.

ENGL 378 Independent Research in English (1-6) Prerequisite: consent of instructor. Designed to provide qualified majors in English an opportunity to pursue

specific English readings under the supervision of a member of the department. Repeatable to a maximum of 6 credits.

ENGL 379 Special Topics in Literature (3) (English majors may not count credits earned in this course toward the total required for the major.) Repeatable to a maximum of 9 hours if the content is different.

ENGL 380 Internship (3-6) Pre-or corequisite: ENGL 381 or 382, and consent of department. The English Department's internship program. Preprofessional experience in writing and editing in a variety of fields.

ENGL 381 MGA Legislative Seminar (3) Prerequisite: consent of department. Classroom analysis component of the Maryland General Assembly internship program.

ENGL 382 Internship Seminar: Corporate Business (3) Prerequisite: consent of the department. Classroom analysis component of the departmental internship program in corporate business.

ENGL 384 Concepts of Grammar (3) Introduction to the basic units of grammatical description; motivation for and nature of constituent structure and syntactic categories; fundamental grammatical concepts employed in the teaching and learning of languages.

ENGL 385 English Semantics (3) An introductory study of meaning in language and paralanguage. General semantics, kinesics, linguistic relativity and recent developments in linguistic semantics.

ENGL 391 Advanced Composition (3) Prerequisite: 56 hours of college credit. An advanced composition course with emphasis on clarity and logic of construction in the writing and revision of short papers on topics related to the student's major, written in a style for the non-specialized reader. A research exercise coordinated with the student's discipline is required.

ENGL 393 Technical Writing (3) Prerequisite: satisfactory completion of 56 credits, which must include ENGL 101 or equivalent. The writing of scientific papers and reports. This course or ENGL 391 is required of students who entered the University in Summer 1978 or thereafter, unless exempt by University regulations. Not open to students who have credit for ENGL 293.

ENGL 399 Senior Seminar (3) Limited to graduating English majors, to be taken in the last year and preferably the last semester of the undergraduate program, normally following completion of the core courses. Topics will vary each semester, most will be interdisciplinary or will cross historical periods. The course will provide a seminar experience in material or methodologies not otherwise available to the major.

ENGL 402 Chaucer (3)

ENGL 403 Shakespeare (3) Early period — histories and comedies.

ENGL 404 Shakespeare (3) Late periods — tragedies and romances.

ENGL 407 Literature of the Renaissance (3)

ENGL 410 Edmund Spenser (3)

ENGL 412 Literature of the Seventeenth Century, 1600-1660 (3)

ENGL 414 Milton (3)

ENGL 415 Literature of the Seventeenth Century, 1660-1700 (3)

ENGL 416 Literature of the Eighteenth Century (3) Age of Pope and Swift.

ENGL 417 Literature of the Eighteenth Century (3) Age of Johnson and the Preromantics.

ENGL 418 Major British Writers (3) Two writers studied intensively each semester.

ENGL 419 Major British Writers (3) Two writers studied intensively each semester.

ENGL 420 Literature of the Romantic Period (3) First generation: Blake, Wordsworth, Coleridge, et. al.

ENGL 421 Literature of the Romantic Period (3) Second generation: Keats, Shelly, Byron, et. al.

ENGL 422 Literature of the Victorian Period (3) Early years.

ENGL 423 Literature of the Victorian Period (3) Middle years.

ENGL 424 Late Victorian and Edwardian Literature (3) A study of the literary movements and techniques which effected the transition from Victorian to modern literature.

ENGL 425 Modern British Literature (3) An historical survey of the major writers and literary movements in English prose and poetry since 1900.

ENGL 430 American Literature, Beginning to 1810, the Colonial and Federal Periods (3)

ENGL 431 American Literature, 1810 to 1865, the American Renaissance (3)

ENGL 432 American Literature, 1865 to 1914, Realism and Naturalism (3)

ENGL 433 American Literature, 1914 to the Present, the Modern Period (3)

ENGL 434 American Drama (3)

ENGL 435 American Poetry: Beginning to the Present (3)

ENGL 436 The Literature of American Democracy (3)

ENGL 437 Contemporary American Literature (3) A survey of the poetry, prose, and drama written in America in the last decade.

ENGL 438 Major American Writers (3) Two writers studied intensively each semester.

ENGL 439 Major American Writers (3) Two writers studied intensively each semester.

ENGL 440 The Novel in America to 1910 (3)

ENGL 441 The Novel in America Since 1910 (3)

ENGL 442 Literature of the South (3) A historical survey, from eighteenth-century beginnings to the present.

ENGL 443 Afro-American Literature (3) An examination of the literary expression of the Negro in the United States, from its beginning to the present.

ENGL 445 Modern British and American Poetry (3) Prerequisite: permission of instructor required for students with credit in ENGL 345. A study of the formation of the "Modern Tradition" in British and American poetry, exploring the distinctive energy and consciousness in the poets of the early twentieth century (1896-1930). Special emphasis on Hopkins, Yeats, Pound, Eliot, and Stevens. Collateral readings in essays on modern poetics, and in other poets of the period.

ENGL 446 Contemporary British and American Poetry (3) Prerequisite: Permission of instructor required for students with credit in ENGL 345. A study of British and American poetry from the Depression to the present. Special emphasis on Auden, Williams, Dylan Thomas, Theodore Roethke, Robert Lowell. A more general study of the work of some of these. Berryman, Jarrell, Fuller, Bishop, Wright, Kinnell, Larkin and including the projectivists, the beats and the present scene.

ENGL 447 Satire (3) An introduction to English and American satire from Chaucer to the present.

ENGL 449 Playwriting (3)

ENGL 450 Elizabethan and Jacobean Drama (3) Beginnings to Marlowe.

ENGL 451 Elizabethan and Jacobean Drama (3) Jonson to Webster.

ENGL 452 English Drama From 1660 to 1800 (3)

ENGL 453 Literary Criticism (3)

ENGL 454 Modern Drama (3)

ENGL 455 The English Novel (3) Eighteenth century.

ENGL 456 The English Novel (3) Nineteenth century.

ENGL 457 The Modern Novel (3)

ENGL 461 Folk Narrative (3) Studies in legend, tale and myth.

ENGL 462 Folksong and Ballad (3)

ENGL 463 American Folklore (3) An examination of American folklore in terms of history and regional folk cultures. Exploration of collections of folklore from various areas to reveal the difference in regional and ethnic groups as witnessed in their oral and literary traditions.

ENGL 464 Afro-American Folklore and Culture (3) An examination of the culture of the Negro in the United States in terms of history (antebellum to the present) and social changes (rural to urban). Exploration of aspects of Negro culture and history via oral and literary traditions and life histories.

ENGL 465 Urban Folklore (3) An examination of the folklore currently originating in white, urban, American culture.

ENGL 466 Arthurian Legend (3) Development of the Arthurian legend of heroism and love in English literature from medieval to modern times.

ENGL 476 Modern Fantasy and Science Fiction (3) Major works of fantasy and science fiction since the mid-eighteenth century emphasizing their continuity and their relationships to philosophical speculation, scientific discovery, literary history and cultural change.

ENGL 478 Selected Topics in English and American Literature Before 1800 (3)

ENGL 479 Selected Topics in English and American Literature After 1800 (3)

ENGL 482 History of the English Language (3)

ENGL 483 American English (3)

ENGL 484 Advanced English Grammar (3) Credit may not be granted in both ENGL 484 and LING 402.

ENGL 485 English Phonology and Phonetics (3) An overview of the sound system of English, surveying traditional methods of analysis as well as contemporary feature analysis. Practice in analysis and transcription of sound.

ENGL 486 Introduction to Old English (3) An introduction to the grammar, syntax, and phonology of Old English. Selected readings from Old English prose and poetry.

ENGL 489 Special Topics in English Language (3) Studies in topics of current interest, repeatable to a maximum of 9 hours.

ENGL 493 Advanced Expository Writing (3)

ENGL 498 Creative Writing (3)

ENGL 499 Advanced Creative Writing (3)

ENMA — Engineering, Materials

ENMA 300 Materials Science and Engineering (3) Prerequisite: ENES 220. Basic principles, nature and properties of engineering materials. Processes and methods to manufacture and usefully apply engineering materials. Fabrication techniques for metals, polymers, and refractories. Students who have credit for ENMA 300 may not take ENME 300 for credit.

ENMA 301 Materials Engineering Laboratory (1) Pre- or corequisite: ENMA 300. One laboratory a week. Fatigue, tensile and impact testing, heat treatment and hardenability, structure and properties of steels, case studies. Students who have credit for ENMA 301 may not take ENME 301 for credit.

ENMA 462 Deformation of Engineering Materials (3) Prerequisites: ENES 230 or consent of instructor. Relationship of structure to the mechanical properties of materials. Elastic and plastic deformation, microscopic yield criteria, state of stress and ductility. Elements of dislocation theory, work hardening, alloy strengthening, creep, and fracture in terms of dislocation theory.

ENMA 463 Chemical, Liquid and Powder Processing of Engineering Materials (3) Prerequisites: ENES 230 or consent of instructor. Methods and processes used in the production of primary metals. The detailed basic principles of beneficiation processes, pyrometallurgy, hydrometallurgy, electrometallurgy, vapor phase processing and electroplating. Liquid metal processing including casting, welding, brazing and soldering. Powder processing and sintering. Shapes and structures produced in the above processes.

ENMA 464 Environmental Effects On Engineering Materials (3) Prerequisites: ENES 230 or consent of instructor. Introduction to the phenomena associated with the resistance of materials to damage under severe environmental conditions. Oxidation, corrosion, stress corrosion, corrosion fatigue and radiation damage are examined from the point of view of mechanism and influence on the properties of materials. Methods of

corrosion protection and criteria for selection of materials for use in radiation environments.

ENMA 470 Structure and Properties of Engineering Materials (3) A comprehensive survey of the atomic and electronic structure of solids with emphasis on the relationship of structure to the physical and mechanical properties.

ENMA 471 Physical Chemistry of Engineering Materials (3) Equilibrium multicomponent systems and relationship to the phase diagram. Thermodynamics of polycrystalline and polyphase materials. Diffusion in solids, kinetics of reactions in solids.

ENMA 472 Technology of Engineering Materials (3) Relationship of properties of solids to their engineering applications. Criteria for the choice of materials for electronic, mechanical and chemical properties. Particular emphasis on the relationships between structure of the solid and its potential engineering application.

ENMA 473 Processing of Engineering Materials (3) The effect of processing on the structure of engineering materials. Processes considered include refining, melting and solidification, purification by zone refining, vapor phase processing, mechanical working and heat treatments.

ENMA 495 Rheology of Engineering Materials (3) Prerequisites: ENES 230 or consent of instructor. Study of the deformation and flow of engineering materials and its relationship to structural type. Elasticity, viscoelasticity, anelasticity and plasticity of single phase and multiphase materials. Students who have credit for ENMA 495 may not take ENCH 495 for credit.

ENMA 496 Polymeric Engineering Materials (3) Prerequisite: ENES 230. A comprehensive summary of the fundamentals of particular interest in the science and applications of polymers. Polymer single crystals, transformations in polymers, fabrication of polymers as to shape and internal structure. Students who have credit for ENMA 496 may not take ENCH 496 for credit.

ENME — Engineering, Mechanical

ENME 205 Engineering Analysis and Computer Programming (3) Three lectures a week. Pre- or corequisite: MATH 241. Continuation of computer programming techniques: flowcharts, algorithms, and computer languages. Introduction to numerical techniques and error analysis in solving for roots of equations, simultaneous equations, interpolation, numerical differentiation and integration, numerical solution of differential equations. Applications to engineering problems.

ENME 217 Theromodynamics (3) Prerequisites: PHYS 262, MATH 141. Properties, characteristics and fundamental equations of gases and vapors. Work transfer and heat transfer, first and second laws of thermodynamics, entropy, irreversibility, availability, and the thermodynamics of mixtures.

ENME 300 Materials Science and Engineering (3) Prerequisite: ENES 220. Basic principles, nature and properties of engineering materials. Processes and methods to manufacture and usefully apply engineering materials. Fabrication techniques for metals, polymers, and refractories. Students who have credit for ENME 300 may not take ENMA 300 for credit.

ENME 301 Materials Engineering Laboratory (1) One laboratory a week. Pre- or corequisite: ENME 300. Fatigue, tensile and impact testing, heat treatment and hardenability, structure and properties of steels, case studies. Students who have credit for ENME 301 may not take ENMA 301 for credit.

ENME 315 Intermediate Thermodynamics (3) Prerequisite: ENME 342. Application of the first and second laws of thermodynamics in the analysis of basic heat engines, air compression and vapor cycles. Heat sources in fossil fuels and nuclear fuels. The thermodynamics of fluid flow.

ENME 320 Thermodynamics (3) Prerequisite: MATH 141, PHYS 262. The properties, characteristics and fundamental equations of gases and vapors. Application of the first and second laws of thermodynamics in the analysis of basic heat engines, air compression vapor cycles. Flow and non-flow processes for gases and vapors.

ENME 321 Transfer Processes (3) Prerequisite: ENME 342. Conduction by steady state and transient heat flow, laminar and turbulent flow, free and forced convection, radiation, evaporation and condensation vapors. Transfer of mass, heat and momentum.

ENME 342 Fluid Mechanics I (3) Prerequisite: ENME 217. Fluid flow concepts and basic equations, effects of viscosity and compressibility. Dimensional analysis and laws of simularity. Flow through pipes and over immersed bodies. Principles of flow measurement.

ENME 343 Fluid Mechanics Laboratory (1) One laboratory a week. Laboratory to be taken concurrently with ENME 342. Measurement of fluid properties, determination of pressure drops in pipes and fittings, observation of fluid phenomena. Experiment and demonstration of flow measurement techniques.

ENME 360 Dynamics of Machinery (3) Prerequisites: ENES 221 and MATH 246. Dynamic characteristics of machinery with emphasis on systems with single and multiple degree of freedom.

ENME 381 Measurements Laboratory (3) Two lectures and one laboratory period a week. Prerequisites: ENME 360 and ENEE 300. Required of juniors in mechanical engineering. Measurements and measurement systems, application of selected instruments with emphasis on interpretation of results.

ENME 398 Honors Research Project (1-3)

ENME 400 Machine Design (3) Two lectures and one laboratory period a week. Prerequisite: ENME 300, 360. Working stresses, stress concentration, stress analysis and repeated loadings. Design of machine elements. Kinematics of mechanisms.

ENME 402 Selected Topics in Engineering Design (3) Three lecture periods per week. Prerequisite: senior standing in mechanical engineering or consent of instructor. Creativity and innovation in design. Generalized performance analysis, reliability and optimization as applied to the design of components and engineering systems. Use of computers in design. Design of multivariable systems.

ENME 403 Automatic Controls (3) Prerequisites: ENEE 300, senior standing. Hydraulic, electrical, mechanical and pneumatic automatic control systems. Open and closed loops. Steady state and transient operation, stability criteria, linear and non-linear systems. Laplace transforms.

ENME 404 Mechanical Engineering Systems Design (4) Two lectures and two laboratory periods per week. Prerequisite: senior standing in mechanical engineering. Design of components that form a complete working system. Engineering economics, performance-cost studies, optimization. Engineering design practice through case studies. Legal and ethical responsibility of the designer.

ENME 405 Energy Conversion Design (3) Two lectures and one laboratory per week. Prerequisite: senior standing in mechanical engineering. Application of thermodynamics, fluid mechanics and heat transfer to energy conversion processes. Design of engines, compressors, heat exchangers. Energy storage and fuel handling equipment.

ENME 410 Operations Research I (3) Prerequisite: senior standing in mechanical engineering. Applications of linear programming, queuing model, theory of games and competitive models to engineering problems.

ENME 411 Introduction to Industrial Engineering (3) Prerequisites: ENME 300 and ECON 205 or consent of instructor. This course is concerned with the design, improvement and installation of integrated systems of men, materials and equipment. Areas covered include industrial activities, plant layout and design, value analysis, engineering economics, quality and production control, methods engineering, industrial relations, etc.

ENME 412 Mechanical Design For Manufacturing and Production (3) Prerequisite: senior standing in engineering. The physical properties of materials. Review of key fundamental principles used in product design. Characterization of various classes of engineering materials. The types of manufacturing processes which can be applied to production of the design.

ENME 414 Computer-Aided Design (3) Prerequisites: ENME 205, MATH 241 or equivalents. Introduction to computer graphics. Plotting and drawing with computer software. Principles of writing interactive software. The applications of computer graphics in computer-aided design. Computer-aided design project.

ENME 415 Engineering Applications of Solar Energy (3) Prerequisites: ENME 315 AND 321. Collection, storage, and utilization of solar thermal energy. Conversion to electricity. Component and system modeling equations. Performance analysis. Systems design.

ENME 420 Energy Conversion (3) Prerequisite: ENME 320. Chemical, heat, mechanical, nuclear and electrical energy conversion processes, cycles and systems. Direct conversion processes of fuel cells, thermionics and magneto hydromechanics.

ENME 422 Energy Conversion II (3) Prerequisite: ENME 315. Advanced topics in energy conversion. Direct conversion processes of fuel cells, solar cells, thermionics, thermoelectrics and magnetohydrodynamics.

ENME 423 Environmental Engineering (3) Prerequisite: ENME 321 and senior standing in mechanical engineering. Heating and cooling load computations. Thermodynamics of refrigeration. Low temperature refrigeration. Problems involving extremes of temperature, pressure, acceleration and radiation.

ENME 424 Thermodynamics II (3) Prerequisites: ENME 321, senior standing. Applications to special systems, change of phase, low temperature. Statistical concepts, equilibrium, heterogenous systems.

ENME 442 Fluid Mechanics II (3) Prerequisite: ENME 342, senior standing. Hydrodynamics with engineering applications. Stream function and velocity potential, conformal transformations, pressure distributions, circulation, numerical methods and analogies.

ENME 450 Mechanical Engineering Analysis For the Oceanic Environment (3) Prerequisite: junior standing. Study of the characteristics of the marine environment which affect the design, operation and maintenance of mechanical equipment, effects of waves, currents, pressure, temperature, corrosion, and fouling. Study of design parameters for existing and proposed mechanical systems used in marine construction, on shipboard, in search and salvage operations.

ENME 451 Mechanical Engineering Systems For Underwater Operations (3) Prerequisite: ENME 450 or consent of instructor. Study of propulsion, control and environmental systems for submerged vehicles. Design of mechanical systems in support of diving and saturated living operations.

ENME 452 Physical and Dynamical Oceanography (3) Prerequisites: consent of the instructor. Historical review of oceanography, physical, chemical stratification and circulation properties of the ocean, dynamics of frictionless, frictional, wind driven and thermohaline circulations, air-sea interactions.

ENME 453 Ocean Waves, Tides and Turbulences (3) Prerequisite: METO 420 or consent of instructor. Introduction to the theory of oceanic wave motions, tides, wind waves, swells, storm surges, seiches, tsunamies, internal waves, turbulence, stirring, mixing and diffusion.

ENME 461 Dynamics II (3) Prerequisites: ENME 360, differential equations, senior standing in mechanical engineering. Linear and non-linear plane and three-dimensional motion, moving axes, LaGrange's equation, Hamilton's principle, non-linear vibration, gyroscope, celestial mechanics.

ENME 462 Introduction to Engineering Acoustics (3) Prerequisite: MATH 246. Study of the physical behavior of sound waves. Introduction to terminology and instrumentation used in acoustics. Criteria for noise and vibration control. Some fundamentals underlying noise control and applications to ventilation systems, machine and ship quieting, office buildings, jet noise, transportation systems and underwater sound.

ENME 463 Mechanical Engineering Analysis (3) Prerequisite: MATH 246. Mathematical modeling of physical situations. Solution of problems expressed by partial differential equations. Application of Fourier series and integrals. Laplace transformation. Bessel functions. Legendre polynomials and complex problems in mechanical vibrations, heat transfer, fluid mechanics and automatic control theory.

ENME 464 Machine Design II (3) Prerequisite: ENME 400. The study of stress and strain as applied to engineering problems; stress and strain from a three dimensional point of view; theories of failure; residual stresses; dynamic loading; fatigue; environmental influence; temperature extremes; corrosive media. Case studies of design practices.

ENME 465 Introductory Fracture Mechanics (3) Prerequisite: senior standing in engineering. An examination of the concepts of fracture in members with pre-existing flaws. Emphasis is primarily on the mechanics aspects with the development of the Griffith theory and the introduction of the stress intensity factor, K, associated with different types of cracks. Fracture phenomena are introduced together with critical values of the fracture toughness of materials. Testing procedures for characterizing materials together with applications of fracture mechanics to design are treated.

ENME 480 Engineering Experimentation (3) One lecture and two laboratory periods a week. Prerequisite: senior standing in mechanical engineering. Theory of experimentation. Applications of the principles of measurement and instrumentation systems to laboratory experimentation. Experiments in fluid mechanics, solid mechanics and energy conversion. Selected experiments or assigned projects to emphasize planned procedure, analysis and communication of results, analogous systems and leadership.

ENME 481 Engineering Experimentation (3) One lecture and two laboratory periods a week. Prerequisite: senior standing in mechanical engineering. Theory of experimentation. Applications of the principles of measurement and instrumentation systems to laboratory experimentation. Experiments in fluid mechanics, solid mechanics and energy conversion. Selected experiments or assigned projects to emphasize planned procedure, analysis and communication of results, analogous systems and leadership.

ENME 488 Special Problems (3) Prerequisite: permission of department chairman. Advanced problems in mechanical engineering with special emphasis on mathematical and experimental methods.

ENME 489 Special Topics in Mechanical Engineering (3) Prerequisite: permission of department chairman. May be taken for repeated credit up to a total of 6 credits, with the permission of the student's advisor. Selected topics of current importance in mechanical engineering.

ENME 518 Mechanical Engineering Professional Elective (2) Prerequisite: B.S. in engineering or consent of instructor. Subjects as announced. Current topics or recent development of interest to the practicing engineer. Not applicable towards a graduate degree.

ENNU — Engineering, Nuclear

ENNU 215 Introduction to Nuclear Technology (3) Prerequisites: MATH 141 and PHYS 161. Engineering problems of the nuclear energy complex, including basic theory, use of computers, nuclear reactor design and isotopic and chemical separations.

ENNU 310 Environmental Aspects of Nuclear Engineering (3) Prerequisites: MATH 241 OR 246 or equivalent, and physics 263, or permission of instructor. Evaluation of environmental and safety aspects of nuclear power reactors. Calculations of radioactive decay, activation, and shielding, radiation monitoring. Biological effects of radiation, waste handling, siting, plant design and operations, as related to environment safety and licensing regulations.

ENNU 320 Nuclear Reactor Operation (3) Introduction to nuclear reactor operations. Outline of reactor theory. Nature and monitoring techniques of ionizing radiation, radiation safety. Reactor instrument response. Operation of The University of Maryland nuclear reactor.

ENNU 398 Honors Research Project (1-3)

ENNU 430 Radioisotope Power Sources (3) Prerequisite: ENNU 215 or permission of instructor. Principles and theory of radioisotope power sources. Design and use of nuclear batteries and small energy conversion devices.

ENNU 435 Activation Analysis (3) Prerequisite: ENNU 215 or permission of instructor. Principles and techniques of activation analysis involving neutrons, photons and charged particles. Emphasis placed upon application of this analytical technique to solving environmental and engineering problems.

ENNU 440 Nuclear Technology Laboratory (3) One lecture and two laboratory periods a week. Prerequisites: MATH 240, PHYS 263. Techniques of detecting and making measurements of nuclear or high energy radiation. Radiation safety experiments. Both a sub-critical reactor and the swimming pool critical reactor are sources of radiation.

ENNU 450 Nuclear Reactor Engineering I (3) Prerequisites: MATH 246 and PHYS 263 or consent of instructor. Elementary nuclear physics, reactor theory, and reactor energy transfer. Steady-state and time-dependent neutron distributions in space and energy. Conduction and convective heat transfer in nuclear reactor systems.

ENNU 455 Nuclear Reactor Engineering II (3) Prerequisite: ENNU 450. General plant design considerations including radiation hazards and health physics, shielding design, nuclear power economics, radiation effects on reactor materials, and various types of nuclear reactor systems.

ENNU 460 Nuclear Heat Transport (3) Prerequisite: ENNU 450. Heat generation in nuclear reactor cores, conduction and transfer to coolants. Neutron flux distributions, fission and heat release. Steady and unsteady state conduction in fuel elements. Heat transfer to nonmetallic and metallic coolants. Heat transfer with phase change. Thermal design of reactor cores.

ENNU 461 Chemical Separation in the Nuclear Cycle Reactor Fuel (3) Prerequisite: ENNU 450 or consent of instructor. An introduction to chemical and physical separation of the nuclear reactor fuel. Basic separation processes, reactor fuel fabrication, reactor chemistry problems and the handling and treatment of radioactive waste. Calculations of plant design and operation. Related safety issues.

ENNU 465 Nuclear Reactor Systems Analysis (3) Prerequisites: Math 246, PHYS 263, ENNU 455, or permission of instructor. Power reactor (BWR,PWR,HTGR) system design and analysis. System specifications and modes of operation. Plant documentation (PSAR,FSAR, etc.). Piping and instrumentation drawings. Theory and application of pump and piping calculations. Steam power plant cycles and calculations. Steam plant equipment (turbines, heaters, condensers, etc.) analysis.

ENNU 468 Research (2-3) Prerequisite: permission of the staff. Investigation of a research project under the direction of one of the staff members. Comprehensive reports are required. Repeatable to a maximum of six semester hours.

ENNU 470 Introduction to Controlled Fusion (3) Prerequisite: senior standing in engineering or consent of instructor. The principles and the current status of research to achieve controlled thermonuclear power production. Properties of ionized gases relating to confinement and heating. Concepts of practical fusion devices.

ENNU 480 Reactor Core Design (3) Prerequisite: ENNU 450 or consent of instructor. Design of nuclear reactor cores based on a sequence of standard computer codes. Thermal and epithermal cross sections, multigroup diffusion theory in one and two dimensions and fine structure flux calculations using transport theory.

ENNU 490 Nuclear Fuel and Power Management (3) Prerequisites: ENNU 460 and 480, or consent of instructor. Physics and economics of the nuclear fuel cycle utilizing existing design codes. Mining, conversion, enrichment, fabrication, reprocessing processes. Effects of plutonium recycle, in-core shuffling, fuel mechanical design and power peaking on fuel cycle costs.

ENTM — Entomology

ENTM 100 Insects (3) A survey of the major groups of insects, their natural history, and their relationships with man and his environment.

ENTM 111 Beekeeping (2) First semester. A study of the life history, behavior and seasonal activities of the honeybee, its place in pollination of flowers with emphasis on plants of economic importance and bee lore in literature.

ENTM 205 Principles of Entomology (4) Three lectures and one two-hour laboratory period per week. An introductory overview to the biology and diversity of insects. Basic physiological, ecological and behavioral processes that result in the dominance of insects in the animal kingdom. The management of pest insect populations and the consequences of the strategies used to regulate insect pests. A collection is required.

ENTM 252 Agricultural Insect Pests (3) Two lectures and one two-hour laboratory period a week. Prerequisite: BOTN 101 or ZOOL 101. An introduction to the principal insect pests of fruit, vegetable, forage, and ornamental crops, with special reference to Maryland agriculture. Not open to entomology majors.

ENTM 303 International Pesticide Problems and Solutions (3) Prerequisite: permission of instructor. A global assessment of economic, environmental, legal, and social consequences of pests, pesticides, and alternative pest control methods. Case studies of the influence of legal action, government export and import policies, international aid, marketing practices, research and education, and human perceptions on pesticide use. Emphasis on pest and pesticide problems in the Third World and progress in developing pest and pesticide management systems to solve these problems.

ENTM 351 Introduction to Insect Population Management (3) Three lecture periods a week. An introduction to the theory and practice of management of insect populations. The course explores the development of all insect pest population suppression methods, as well as the management of insect populations beneficial to man. The main theme of the course is how man can manipulate environmental components for the purpose of population regulation of insects, and the beneficial and harmful effects of these manipulations.

ENTM 398 General Colloquium in Entomology (1) Prerequisite: ENTM 205 or consent of instructor. Presentation of original research by invited guest speakers, faculty, and graduate students. No more than 1 credit hour of ENTM 398 may be applied to THE 120 credit hours needed for the Bachelor's degree.

ENTM 399 Special Problems (1-2) Prerequisite: ENTM 205. Permission of instructor. Credit to be determined by the department. Should be taken during the junior year. Investigations of assigned entomological problems. No more than 4 credit hours of ENTM 399 may be applied to THE 120 credit hours needed for the Bachelor's degree.

ENTM 407 Entomology For Science Teachers (4) Summer. Four lectures and four three-hour laboratory periods a week. This course will include the elements of morphology, taxonomy and biology of insects using examples commonly available to high school teachers. It will include practice in collecting, preserving, rearing and experimenting with insects insofar as time will permit.

ENTM 412 Advanced Apiculture (3) One lecture and two three-hour laboratory periods a week. Prerequisite: ENTM 111. The theory and practice of apiary management. Designed for the student who wishes to keep bees or requires a practical knowledge of bee management.

ENTM 423 Insect Morphology and Classification (4) Two one-hour lectures and two three-hour laboratory periods a week. Prerequisite: ENTM 205. A detailed study of the morphology and anatomy of insects. Emphasis on a comparison of structures using specimens from common orders to study the phylogenetic relationships and to form a basis for understanding insect classification systems.

ENTM 424 Insect Collection and Identification (4) One hour of lecture and seven hours of field work per week. Prerequisites: ENTM 205 and ENTM 423. The techniques of collecting insects in the field and their classification into the latest hierarchial scheme. Field trips will visit habitats throughout the state. An insect collection is required.

ENTM 432 Insect Physiology (4) Three hours of lecture and one three-hour laboratory per week. Prerequisites: ENTM 205, CHEM 233, and CHEM 243; or consent of instructor. The physiology of different insect systems. Hormonal basis of insect metamorphosis and reproduction.

ENTM 451 Insect Pests of Agricultual Crops (4) Two lectures and two two-hour laboratory periods a week. Prerequisite: ENTM 205. The recognition, biology and control of insects injurious to fruit and vegetable crops,

field crops and stored products

ENTM 452 Insecticides (2) Prerequisite: consent of the department. The development and use of contact and stomach poisons, fumigants and other important chemicals, with reference to their chemistry, toxic action, compatability, and host injury. Recent research emphasized.

ENTM 453 Insect Pests of Ornamentals and Turf (3) Prerequisite: ENTM 205 or consent of instructor. Two lectures and one three-hour laboratory period a week. The recognition, biology and control of insects and mites injurious to ornamental shrubs, trees, greenhouse crops, and turf. Emphasis on pests of woody ornamental plants.

ENTM 455 Urban Entomology (3) Two lectures and one three-hour laboratory period a week. Prerequisite: ENTM 421 or consent of instructor. A study of the appearance, habits, life cycles and methods of control of pests of humans, pets and structures in the urban environment. Field observations of professional pest control operations and a paper on a selected pest group are required.

ENTM 472 Medical and Veterinary Entomology (4) Three lectures and one two-hour laboratory period a week. Prerequisite: ENTM 205 or consent of department. A study of the morphology, taxonomy, biology and control of the arthropod parasites and disease vectors of man and animals. The ecology and behavior of vectors in relation to disease transmission will be emphasized.

FDSC — Food Science

FDSC 111 Contemporary Food Industry and Consumerism (3) Three lecture hours per week. The role of the food processing industry in attempting to satisfy man's need for food. Food quality nutritional, sensory, and compositional; conventional vs "natural" organic foods; preservation and spoilage-role of chemical additives, synthetic and convenience foods; consumer protection; the food industry and the environment; future food sources.

FDSC 398 Seminar (1) Presentation and discussion of current literature and research in food science.

FDSC 399 Special Problems in Food Science (1-3) Prerequisite: approval of staff. Designed for advanced undergraduates in which specific problems in food science will be assigned. Four credit maximum per student.

FDSC 412 Principles of Food Processing I (3) The principles of thermal processing including heat resistance of bacteria and bacterial spores, concepts of lethality, heat transfer, and thermal process calculations. Advanced systems of thermal processing and packaging including aseptic applications.

FDSC 413 Principles of Food Processing II (3) Three lectures per week. A detailed study of food processing with emphasis on line and staff operations, including physical facilities, utilities, pre-and post-processing operations, processing line development and sanitation.

FDSC 421 Food Chemistry (3) Three lectures per week. Prerequisite: CHEM 113. The application of basic chemical and physical concepts to the composition and properties of foods. Emphasis on the relationship of processing technology, to the keeping quality, nutritional value, and acceptability of foods.

FDSC 422 Food Product Research and Development (3) Two lectures, and one laboratory per week. Prerequisites: FDSC 413, BCHM 461, or permission of instructor. A study of the research and development function for improvement of existing products and development of new, economically feasible and marketable food products. Application of chemical-physical characteristics of ingredients to produce optimum quality products, cost reduction, consumer evaluation, equipment and package development.

FDSC 423 Food Chemistry Laboratory (2) Pre- or corequisite: FDSC 421. Two laboratory per week. Analysis of the major and minor constituents of food using chemical, physical and instrumental methods in concordance with current food industry and regulatory practices. Laboratory exercises coincide lecture subjects in FDSC 421.

FDSC 430 Food Microbiology (2) Two lectures per week. Prerequisite: MICB 200 or equivalent. A study of microorganisms of major importance to the food industry with emphasis on food-borne outbreaks, public health significance, bioprocessing of foods and control of microbial spoilage of foods.

FDSC 431 Food Quality Control (4) Three lectures and one laboratory per week. Definition and organization of the quality control function in the food industry, preparation of specifications, statistical methods for acceptance sampling, in-plant and processed product inspection, instrumental and sensory methods for evaluating sensory quality, identity and wholesomeness and their integration into grades and standards of quality.

FDSC 434 Food Microbiology Laboratory (2) Two laboratories per week. Pre- or corequisite: FDSC 430. A study of techniques and procedures used in the microbiological examination of foods.

FDSC 442 Horticultural Products Processing (3) Two lectures and one laboratory per week. Commercial methods of canning, freezing, dehydrating, fermenting, and chemical preservation of fruit and vegetable crops.

FDSC 451 Dairy Products Processing (3) Two lectures and one laboratory per week. Method of production of fluid milk, butter, cheese, condensed and evaporated milk and milk products and ice cream.

FDSC 461 Technology of Market Eggs and Poultry (3) Two lectures and one laboratory per week. A study of the technological factors concerned with the processing, storage, and marketing of eggs and poultry and the factors affecting their quality.

FDSC 471 Meat and Meat Processing (3) Two lectures and one laboratory a week. Prerequisite: BCHM 461 or permission of instructor. Physical and chemical characteristics of meat and meat products, meat processing, methods of testing and product development.

FDSC 482 Seafood Products Processing (3) Two lectures and one laboratory a week. Prerequisite: BCHM 461 or permission of instructor. The principal preservation methods for commercial seafood products with particular reference to the invertebrates. Chemical and microbiological aspects of processing are emphasized.

FMCD — Family and Community Development

FMCD 105 The Individual in the Family (3) Study of personality development within the family context. Emphasis on identity and self-awareness.

FMCD 200 Pre-professional Seminar (1) Prerequisite: consent of department. Introduction to the family, community, and management-consumer fields. Consideration of professional opportunities.

FMCD 201 Concepts in Community Development (3) Theory and practice of development in neighborhood, national and international communities. Models for community action program development and service delivery.

FMCD 202 Methods for Family, Community and Management Studies (3) Introduction to the methods of the social and behavioral sciences employed in family, community and management-consumer studies. The role of theory, the development of hypotheses, measurement, validity, data collection, and data analysis.

FMCD 250 Decision Making in Families and Communities (3) Introduction to problem solving, decision theory, and systems analysis, and their application to the practical problems facing families, human service organizations, and local communities.

FMCD 260 Interpersonal Life Styles (3) Prerequisite: FMCD 105 or equivalent. Couple relationships in contemporary dating, courtship and marriage, and their alternatives.

FMCD 280 Families and Communities in the Ecosystem (3) Families and communities in the ecological system. The impact of energy and related environmental problems on families, human service organizations, and local communities.

FMCD 330 Family Patterns (3) Theory and research on the family, including a cross-cultural analysis of family patterns.

FMCD 332 The Child in the Family (3) Prerequisite: FMCD 105 or PSYC 100. A family life education approach to the study of children and families. Emphasis on the interaction of children with parents, siblings, extended kin and the community.

FMCD 343 Applied Family and Household Management (3) Prerequisite: consent of department. For the student who is currently involved in household management. Management experience similar to that of FMCD 344. Credit awarded for only one of: FMCD 343 or FMCD 344.

FMCD 344 Resident Experience in Home Management (3) Four to nine weeks. Prerequisite: FMCD 250. Group living and management experience providing opportunity to examine decision patterns, participate in group decission making and analyze value systems and resource utilization which differ from the student's own. (Each student pays $60 which is used for food and supplies. The University Housing Office bills non-dormitory students for room rent at the rate of $5 per week.) Credit awarded for only one of: FMCD 343 or FMCD 344.

FMCD 348 Practicum in Family and Community Development (3-12) Prerequisites: FMCD 270 plus 6 credits of practicum-related course work. Corequisite: FMCD 349. Departmental approval required prior to registration.For FMCD majors a planned, supervised practicum to complement classroom instruction. Maximum of 12 credits allowed towards degree requirements.

FMCD 349 Analysis of Practicum (1-2) For FMCD majors only. Weekly seminars for students concurrently carrying FMCD 348. Opportunities to integrate theory and practice. Two credits for the first semester and one credit every semester thereafter for a maximum total of five credits.

FMCD 370 Interpersonal Communication Processes (3) Training in interpersonal communication skills. Relevant concepts, principles, and models.

FMCD 381 Poverty and Affluence Among Families and Communities (3) Prerequisite: FMCD 201 or SOCY 100 or SOCY 105. Social, political, economic interrelationships among families and communities with respect to varying resources.

FMCD 399 Independent Study (1-6) Prerequisite: Consent of instructor and department. May be repeated to a maximum of 12 credits.

FMCD 430 Gender Role Development in the Family (3) Prerequisites: SOCY100 and FMCD 260 or consent of instructor. The development of historical, cultural, developmental, and psychosocial aspects of masculinity and femininity within the context of contemporary families and the implications for interpersonal relations.

FMCD 431 Family Crises and Intervention (3) Prerequisite: PSYC 100. Family crises such as divorce, disability, substance abuse, financial problems, intrafamilial abuse, and death. Theories and techniques for intervention and enhancement of family coping strategies.

FMCD 432 Intergenerational Aspects of Family Living (3) Prerequisites: PSYC 100, SOCY 100, FMCD 332 or other human development course. The historical, cultural, developmental, and psychosocial experiences of contemporary American generations. Interactions across generations within the family and the consequences for individual development. Cross-national comparisons.

FMCD 441 Personal and Family Finance (3) Prerequisite: ECON 201 or 205, or consent of instructor. Study of individual and family financial strategies with particular emphasis upon financial planning, savings, insurance, investments, income taxes, housing, and use of credit.

FMCD 443 Consumer Problems (3) Prerequisite: ECON 201 or 205, or consent of instructor. The consumer perspective in the production, marketing, and use of goods and services. Special emphasis on the investigation of current issues.

FMCD 444 Human and Community Program Management (3) Goals, approaches, settings, and resources relevant to the management of human service programs in the community.

FMCD 445 Family and Household Management (3) Interrelationship of resources (time, money, energy,

space, materials and human resources) in operation of the household and in meeting demands of multiple roles of family members. Management as intervention strategy

FMCD 446 Cross Cultural Family and Community Field Experiences (3-6) Prerequisite: consent of the instructor. An experience in and analysis of living in a sub-culture other than one's own, participating in family and community activities

FMCD 447 The Disabled Person in the Family and Community (3) Prerequisite: PSYC 100 or SOCY 100. Disabled persons in family and community settings. Improvement of the quality of life of disabled persons

FMCD 448 Selected Topics in Home Management (3) Seminar format will be used to examine the ways families set priorities and organize their efforts and resources to achieve both social and economic goals. Prior registration in FMCD 250, 341, or other courses in management theory, systems analysis or research methods is desirable. Repeatable for a maximum of 6 credits provided subject matter is different.

FMCD 453 Family and Community Advocacy (3) Prerequisites: 6 credits in SOCY and GVPT. Strategies for change used by governmental and non-governmental institutions to improve the quality of family and community life in a variety of political, social and historical contexts.

FMCD 460 Violence in the Family (3) Prerequisite: PSYC 100 or SOCY 105 or FMCD 487. Theories of child, spousal, parental, grandparental abuse in the family setting; review of current evidence, and an introduction to methods for prevention and remediation.

FMCD 483 Family and Community Service Systems (3) Prerequisites: 6 credits in SOCY and GVPT. The planning, implementation, administration, and evaluation of human services systems affecting families and communities. Major organizational theories, managerial styles, administrative techniques, and issues in human service delivery.

FMCD 485 Introduction to Family Counseling (3) Prerequisites: FMCD 431, PSYC 331, PSYC 335, or permission of instructor. The fundamental theoretical concepts and clinical procedures that are unique to marital and family therapy. Individually-orien ted psycotherapy. Pre-marital, marital and family, and divorce counseling techniques.

FMCD 487 Legal Aspects of Family Problems (3) Prerequisite: FMCD 105 or SOCY 105. Laws and legal procedures, with emphasis on adoption, marriage, divorce, annullment, and property rights, and how they affect family life.

FMCD 497 The Child and the Law (3) Legislation and case law regarding children's legal rights with emphasis on the rights of children in the juvenile justice system, and rights to medical, educational, and other social services.

FMCD 499 Special Topics (1-3) A - Family Studies B - Community Studies C - Management and Consumer Studies

FOLA — Foreign Language

FOLA 108 Elementary Foreign Languages I (3) The first semester of conversational study of a language not otherwise offered. May be repeated for credit if language covered is different. The arts and humanities language requirement may be fulfilled by successful completion of FOLA 108, 109, 118 AND 119 in a single language.

FOLA 109 Elementary Foreign Languages II (3) Prerequisite: FOLA 108 in the subject language or permission of the instructor. The second semester of conversational study of a language not otherwise offered. May be repeated for credit if language covered is different. The arts and humanities language requirement may be fulfilled by successful completion of FOLA 108, 109, 118 AND 119 in a single language.

FOLA 118 Intermediate Foreign Languages I (3) Prerequisite: FOLA 109 in the subject language or permission of the instructor. The third semester of conversational study of a language not otherwise offered. May be repeated for credit if language covered is different. The arts and humanities language requirement may be fulfilled by successful completion of FOLA 108, 109, 118 AND 119 in a single language.

FOLA 119 Intermediate Foreign Languages II (3) Prerequisite: FOLA 118 in the subject language or permission of the instructor. The fourth semester of conversational study of a language not otherwise offered. May be repeated for credit if language covered is different. The arts and humanities language requirement may be fulfilled by successful completion of FOLA 108, 109, 118 and 119 in a single language.

FOLA 128 Introductory Middle Eastern Languages I (3) Prerequisite: consent of the department. An introduction to the three principal languages of the Islamic Middle East- Arabic, Persian, and Turkish. Only standard written form of the three languages is taught. May be repeated to a maximum of nine hours when language varies. May not be used to satisfy arts and humanities language requirement.

FOLA 129 Introductory Middle Eastern Languages II (3) Prerequisite: FOLA 128 and consent of the department. Continuation of FOLA 128. May be repeated to a maximum of nine hours when languages varies. May not be used to satisfy arts and humanities language requirement.

FOLA 138 Directed Study of a Foreign Language I (3) Directed study of a modern foreign language with use of a self-instructiona l approach. Open only by permission of program director to students of high motivation and proven language learning aptitude.

FOLA 139 Directed Study of a Foreign Language II (3) Prerequisite: FOLA 138 in the same language or permission of program director. A continuation of FOLA 138.

FOLA 148 Directed Study of a Foreign Language III (3) Prerequisite: FOLA 139 in the same language or permission of the program director. A continuation of FOLA 139.

FOLA 149 Directed Study of a Foreign Language IV (3) Prerequisite: FOLA 148 in the same language or permission of program director. A continuation of FOLA 148.

FOLA 158 Directed Study of a Foreign Language (Intensive) I (6) Intensive directed study of a modern foreign language with use of a self-instructional approach. Open only by permission of program director to students of very high motivation and proven language learning aptitude. Equivalent to FOLA 138 plus FOLA 139.

FOLA 159 Directed Study of a Foreign Language (Intensive) II (6) Prerequisite: FOLA 158 in the same language or permission of program director. A continuation of FOLA 158. Equivalent to FOLA 148 plus FOLA 149.

FOLA 228 Intermediate Middle Eastern Languages I (3) Prerequisite: FOLA 129 and consent of the department. Continuation of FOLA 129. May be repeated to a maximum of nine hours when language varies. May not be used to satisfy arts and humanities language requirement.

FOLA 229 Intermediate Middle Eastern Languages II (3) Prerequisite: FOLA 228 and consent of the department. Continuation of FOLA 228. May be repeated to a maximum of nine hours when language varies. May not be used to satisfy arts and humanities language requirement.

FOLA 328 Advanced Middle Eastern Languages I (3) Prerequisite: FOLA 229 or consent of the department. Continuation of FOLA 229. May be repeated to a maximum of nine hours when language varies. May not be used to satisfy arts and humanities language requirement.

FOLA 329 Advanced Middle Eastern Languages II (3) Prerequisite: FOLA 328 or consent of the department. Continuation of FOLA 328. May be repeated to a maximum of nine hours when languages varies. May not be used to satisfy arts and humanities language requirement.

FOLA 389 Foreign Civilization (3) A survey of the cultural history, arts and letters, folklore and life-style of the speakers of a language not otherwise offered. May be repeated for six credits in a single civilization if content is different. All readings and instruction in English.

FOLA 408 Foreign Language I (3) Intensive study of a foreign language or related topic not available under one of the current foreign language departments or programs. May not be used to fulfill the arts and humanities language requirement.

FOLA 409 Foreign Language II (3) Prerequisite: FOLA 408 in the same language or topic. A continuation of FOLA 408. May not be used to fulfill Division of arts and humanities language requirement.

FOLA 459 Foreign Literature in Translation (3) Reading and discussion of selected authors, periods or genres of a foreign literature not otherwise offered. May be repeated for six credits in a single literature if content is different. All readings and instruction in English.

FOOD — Food

FOOD 105 Professional Orientation (1) A series of lectures introducing the student to the broad field of careers in food, nutrition, dietetics, and institution administration. Includes trends, role of related sciences, educational and personal requirements, ethics, and opportunities in each professional area.

FOOD 110 Food For People (3) A study of food in contemporary living: economic, social, cultural and aesthetic implications of food. Selection and use of food in relation to eating habits and well-being of the individual.

FOOD 210 Scientific Principles of Food Preparation and Management (4) Prerequisite: NUTR 100 or FOOD 110. Three lectures and one three-hour laboratory per week. Study of basic scientific principles as applied to food preparation processes and management of family needs through organization of available resources.

FOOD 240 Science of Food I (3) Two lectures and one three-hour laboratory per week. Pre- or corequisite: CHEM 233 or CHEM 104. Composition and structure of food with study of the fundamental principles involved in food handling and treatment. Especially designed for majors in food, nutrition and institution administration.

FOOD 250 Science of Food II (3) Two lectures and one three-hour laboratory period per week. Prerequisite: FOOD 240. A continuation of FOOD 240.

FOOD 300 Economics of Food Consumption (3) Prerequisites: ECON 201 or 205; and FOOD 110 or NUTR 100. Interrelations of food, population and economic progress; trends in food consumption patterns, world and local food problems.

FOOD 440 Advanced Food Science I (3) Three lectures per week. Prerequisites: FOOD 250 and CHEM 261 or 461. Chemical and physical properties of food as related to consumer use in the home and institutions.

FOOD 445 Advanced Food Science Laboratory (1) Prerequisite or corequisite: FOOD 440. One three-hour laboratory per week. Chemical determination of selected components in animal and plant foods.

FOOD 450 Advanced Food Science II (3) One lecture, two laboratories per week. Prerequisite: FOOD 440 or equivalent. Individual and group laboratory experimentation as an introduction to methods of food research.

FOOD 480 Food Additives (3) Prerequisite: FOOD 440 or equivalent or consent of instructor. Effects of intentionaland incidental additives on food quality, nutritive value and safety. Current regulatory procedures.

FOOD 490 Special Problems in Foods (2-3) Prerequisite: FOOD 440 and consent of instructor. Individual selected problems in the area of food science.

FOOD 498 Special Topics (1-3) Prerequisite: consent of instructor. Selected current aspects of food. Repeatable to a maximum of six credits if the subject matter is substantially different.

FREN — French

FREN 101 Elementary French (4) Introduction to basic structures and pronunciation.

FREN 102 Elementary French (4) Completion of basic structures with emphasis on reading and speaking skills.

FREN 103 Review of Elementary French (4) Limited to students who have had at least two years of high school French (or equivalent) or who do not qualify for FREN 104. Students may not receive credit for both Fren 101/102 and 103.

FREN 104 Intermediate French (4) Grammar review with extended reading, discussion, and composition.

Fulfills the arts and humanities language requirement.

FREN 121 Accelerated French I (3) An intensive beginning course in French language skills guided practice in reading and writing, understanding the spoken language and conversation, to enable the student to move more quickly to advanced courses. Enrollment restricted to students already having a good background at least one other foreign language (successful completion of level 4 in high school, or 104 or equivalent at the university level, or through linguistic competence acquired by residence abroad, or by demonstration of equivalent proficiency) with 122, may be used to satisfy language requirements.

FREN 122 Accelerated French II (3) Prerequisite: FRENCH 121 An intensive beginning course in French language skills guided practice in reading and writing, understanding the spoken language and conversation, to enable the student to move more quickly to advanced courses. May be used to satisfy language requirements.

FREN 200 French For Reading (3) Intensive course designed to bring students to a basic reading and translating competence of ordinary literary and scientific French, with the aid of a dictionary, in one semester. Study of essential grammar, but no spoken or written French involved. No prerequisites Course not open to students who have completed two years high school French or two semesters college French within the last five years nor to students for whom French in the native language May not be used to satisfy the language requirement of the Division of arts and humanities.

FREN 201 Review Grammar and Composition (3) Prerequisite FREN 104 or course chairman's consent. An intensive review of major aspects of contemporary grammatical usage; training in comprehension; an introduction to guided composition.

FREN 211 Intermediate Conversation (3) Prerequisite: FREN 104 or consent of course chairman Practice in spoken French with emphasis on contemporary French topics. Not open to native speakers.

FREN 250 Readings in French (3) Prerequisite: FRENCH 104 or equivalent. Selected readings from various genres in French literature. Discussion and brief written reports in French.

FREN 279 Readings in French Literature in Translation (3) Topic to be determined each semester. All readings, discussions and examinations in English. No prerequisites. Repeatable for a maximum of 6 credits.

FREN 301 Composition and Style (3) Prerequisite: FREN 201, or course chairman's consent. An introduction to the techniques of the dissertation generale; grammatical analysis, free composition.

FREN 302 Introduction to Translation (3) Prerequisite: FREN 301 or course chairman's consent Problems and strategies of translation into both English and French. Journalistic and literary styles, practicum format.

FREN 311 French Conversation: Contemporary Issues (3) Vocabulary development to the level of the contemporary French press. Not open to native speakers of French.

FREN 312 French Conversation: Current Cultural Events (3) Vocabulary development to the level of the contemporary French press. Not open to native speakers of French.

FREN 340 Modern French Literature in Translation (3) A survey of major authors and movements of French literature from pre-revolutionary France to the present. All work in English.

FREN 350 Advanced Readings in French (3) Prerequisite FREN 201 OR 250, or permission of instructor. Selected readings in various genres from important French authors and from works dealing with various aspects of French life, culture, and civilization. Translation, textual analysis, discussion and brief written reports in French.

FREN 351 French Literature From the Revolution to the Present (3) Prerequisite: FREN 201 OR 250, or consent of the instructor A survey of the chief authors and major movements of French literature from Pre-Romanticism to the present.

FREN 352 French Literature From the Middle Ages to the Revolution (3) Prerequisite FREN 201 OR 250, or consent of instructor A survey of the chief authors and major movements of French literature from the Middle Ages to the end of the 18th century

FREN 370 Aspects of French Civilization (3) Political, social, intellectual, and literary forces shaping contemporary France, from the French revolution to the present Taught in English Credit may not be counted toward a French major. Credit not allowed for both FREN 370 and FREN 472

FREN 398 Practicum in Spoken French (1) Prerequisite FREN 312, or permission of department chairman Practice in French conversation at the advanced level Repeatable for a maximum of three credits Will not count toward the French major. Satisfactory/Fail only

FREN 399 Directed Study in French (1-3) Prerequisite permission of department chairman. Intended for advanced undergraduates who wish to work on an individual basis with a professor of their choice Open as elective to all students, but may not be counted toward French major May be taken for one, two or three credits, according to nature and scope of work envisaged May be taken more than once, however, only repeatable for a maximum of three credits. Grading method Satisfactory/Fail only.

FREN 400 Applied Linguistics (3) The nature of applied linguistics and its contribution to the effective teaching of foreign languages. Comparative study of English and French, with emphasis upon points of divergence. Analysis, evaluation and construction of related drills.

FREN 401 Stylistics (3) Prerequisite: FREN 301 or course chairman's consent. Comparative stylistic analysis; translation.

FREN 402 Advanced Grammar and Phonetics (3) Prerequisite FREN 301 or course chairman's consent. Theory and practice of grammatical structures and rules of phonetics.

FREN 404 Advanced Conversation in French (3) Prerequisites FREN 311 and FREN 312, or consent of the instructor Development of fluency in French, stress on correct sentence structure and idiomatic expression. Credit may not be applied toward the major in French.

FREN 405 Explication De Textes (3) Oral and written analysis of short literary works, or of excerpts from longer works chosen for their historical, structural, or stylistic interest, with the purpose of training the major to understand literature in depth and to make mature esthetic evaluations of it.

FREN 406 Business and Commercial French (3) A study of French as used in the business and commercial world.

FREN 407 History of the French Language (3) Evolution of the French language from Latin to modern French.

FREN 419 Studies in Medieval French Literature (3) Selected topics in medieval French literature. Repeatable with different subtitle to a maximum of six credits.

FREN 429 Studies in French Literature of the Renaissance (3) Selected topics in French literature of the Renaissance. Repeatable with different subtitle to a maximum of six credits.

FREN 439 Studies in 17th Century French Literature (3) Selected topics in seventeenth-century French literature. Repeatable with different subtitle to a maximum of six credits.

FREN 449 Studies in 18th Century French Literature (3) Selected topics in eighteenth-century French literature Repeatable with different subtitle to a maximum of six credits

FREN 459 Studies in 19th Century French Literature (3) Selected topics in nineteenth-century French literature Repeatable with different subtitle to a maximum of six credits.

FREN 469 Studies in 20th Century French Literature (3) Selected topics in twentieth-century French literature Repeatable with different subtitle to a maximum of six credits

FREN 471 French Civilization I (3) French life, customs, culture, traditions (800-1750)

FREN 472 French Civilization II (3) French life, customs, culture, traditions (1750—present-day France) Credit not allowed for both FREN 472 and FREN 370.

FREN 473 Contemporary French Society (3) The forces shaping contemporary France Analysis of social groups, economic development, institutions, political structures Lectures, discussions and most readings in French.

FREN 475 French Cinema: A Cultural Approach (3) A study of French culture, civilization, and literature through the medium of film.

FREN 478 Themes and Movements of French Literature in Translation (3) Studies treatments of thematic problems or of literary or historical movements in French literature Topic to be determined each semester Given in English.

FREN 479 Masterworks of French Literature in Translation (3) Treats the works of one or more major French writers Topic to be determined each semester. Given in English.

FREN 489 Pro-Seminar in Themes or Movements of French Literature (3) Repeatable for a maximum of six credits.

FREN 491 Honors Reading Course, Poetry (3) Supervised readings to be taken normally only by students admitted to the honors program.

FREN 492 Honors Reading Course, Novel (3) Supervised readings to be taken normally only by students admitted to the honors program.

FREN 493 Honors Reading Course, Drama (3) Supervised readings to be taken normally only by students admitted to the honors program.

FREN 494 Honors Independent Study (3) Honors independent study involves guided readings based on an honors reading list and tested by a 6 hour written examination. HONR 494 and 495 are required to fulfill the departmental honors requirement in addition to two out of the following, 491H, 492H, 493H Open only to students admitted to the departmental honors program.

FREN 495 Honors Thesis Research (3) Honors thesis research involves the writing of a paper under the direction of a professor in this department and an oral examination HONR 494 and 495 are required to fulfill the departmental honors requirement in addition to two out of the following, 491H, 492H, 493H Open only to students admitted to the departmental honors program.

FREN 498 Special Topics in French Literature (3) Repeatable for a maximum of six credits

FREN 499 Special Topics in French Studies (3) An aspect of French studies, the specific topic to be announced each time the course is offered Repeatable for a maximum of six credits.

GEOG — Geography

GEOG 100 Introduction to Geography (3) An introduction to the broad field of geography as it is applicable to the general education student The course presents the basic rationale of variations in human occupancy of the earth and stresses geographic concepts relevant to understanding world, regional and local issues.

GEOG 110 The World Today: A Regional Geography (3) A geographic examination of major countries and world regions Designed for the general student who wants a basic understanding of the environmental, cultural and economic forces affecting major regions of the world

GEOG 120 Nations in Conflict: A Spatial View (3) The geographic characteristics of conflict areas around the world Issues common to international disputes such as uneven access to resources, population pressures, religious differences and boundary disputes.

GEOG 130 Developing Countries (3) An introduction to the geographic characteristics, development problems and prospects of less developed countries The distribution of poverty, emerging livelihood patterns, migration and urban growth, agricultural productivity, rural development and international trade. Portraits of selected developing countries.

GEOG 140 Coastal Environments (3) Introduction to coastal environments with emphasis on U.S. East Coast Physical and ecological systems, beach processes, waves currents, human impacts, coastal zone management and shoreline engineering Case studies of

coastal areas, including Ocean City, MD.

GEOG 150 World Cities (3) An introduction to the forces that affect the growth of cities in different parts of the world. Regional variations in city design and examples of great world cities. The impact of changing technologies, economic and social change on the evolution of the city. Current and emerging trends.

GEOG 160 World Resources (3) The location of forestry, mineral, energy, maritime and agricultural resources. Identification of resource rich and poor regions and international resource flows. U.S. consumption and production of resources. Emerging world trends.

GEOG 170 Maps and Map Use (3) The use and interpretation of maps encountered in both "everyday" reading, and in scientific literature. Development of skills in map reading, environmental analysis, interpretation and orienteering.

GEOG 171 Maps and Map Use Laboratory (1) One two-hour laboratory per week. Pre- or corequisite: GEOG 170. A laboratory course to accompany GEOG 170. Experience with maps as research tools, coordinate systems, projections, measurement of angles, directions, distance, area, topographic maps, map interpretation; symbolization, statistical mapping, spatial arrangement; and remote sensing.

GEOG 201 Geography of Environmental Systems (3) A systematic introduction to the processes and associated forms of the atmosphere and earth's surfaces emphasizing the interaction between climatology, hydrology and geomorphology.

GEOG 202 The World in Cultural Perspective (3) The imprint of cultural traits, such as religion, language and livelihood systems, on the earth's landscape. The transformation of the earth's surface as a result of cultural diversity, settlement patterns, political organization, cultural evolution, and population growth.

GEOG 203 Economic Geography (3) The spatial characteristics of world economic activities. Population patterns; technology and economic development; principles of spatial interactions in trade; transportation networks; the city as an economic mode; the location of industries and services; the production and trade of agricultural and energy products.

GEOG 211 Geography of Environmental Systems Laboratory (1) Prerequisite or corequisite: GEOG 201, or GEOL 100, or GEOL 120. One two-hour laboratory per week. A laboratory course to accompany GEOG 201. Analysis of the components of the earth's energy balance using basic instrumentation; weather map interpretation; soil analysis; the application of map and air photo interpretation techniques to land form analysis.

GEOG 298 Special Topics in Geography (3) An introductory course dealing with special topics in geography. Repeatable to a maximum of 6 credits when course content differs.

GEOG 305 Quantitative Methods in Geography (3) A practical introduction to data sources and measurement, basic descriptive statistics, data collection, sampling and questionnaire design, field techniques, map use, introduction to computer use and data presentation.

GEOG 310 Research and Writing in Geography (3) Prerequisite: GEOG 305. Development of research methods in geography including the formulation of problem, the establishment of hypotheses, development of structures for testing hypotheses, and practice with forms of geographic presentation. Maps, quantitative and field methods will be used as appropriate.

GEOG 320 North America (3) The contemporary patterns of American and Canadian life from a regional viewpoint. The significance of the physical environment, resource use, the political framework, economic activities, demographic and socio-cultural characteristics, regional identification, and regional problems.

GEOG 321 Maryland and Adjacent Areas (3) The physical environment, natural resources, and population in relation to agriculture, industry, transport, and trade in the State of Maryland and adjacent areas.

GEOG 322 Central America, the Caribbean and Mexico (3) The physical framework, broad economic and historical trends, cultural patterns, and regional diversification of Mexico, Central America, the West Indies.

GEOG 323 South America (3) A survey of natural environment and resources, economic development and cultural diversity of the South American Republics, with emphasis on problems and prospects of the countries.

GEOG 324 Europe (3) The geographical diversity of modern Europe from landscape and regional perspectives. The diverse features of Europe's physical environment and resource base, and their integration into the demographic, economic, social and political patterns of the continent's major geographic regions.

GEOG 325 Soviet Union (3) The natural environment and its regional diversity. Geographical factors in the expansion of the Russian state. The geography of agricultural and industrial production in relation to available resources, transportation problems, and diversity of population.

GEOG 326 Africa (3) A geography of sub-Sahara Africa: physical features, climates, political and cultural regions. Population and resource distribution, current levels of economic and social well-being, development projects and constraints, and migration trends.

GEOG 327 South Asia (3) Methods of regional analysis and area studies applied to the Indian Subcontinent, including India, Pakistan, Bangledesh, Sri Lanka and adjacent nations. Locational significance of the natural environment, historical and cross-cultural processes, languages and religion, the economy and government, population, archaeology, urbanization and development.

GEOG 328 Topics in Regional Geography (3) Selected topics in regional geography. Repeatable to a maximum of 6 credits when course content differs.

GEOG 330 East Asia (3) The geographic characteristics of China, Japan, and Korea. The physical setting, climate, population distribution, cultural and language regions. Contemporary problems, resource distribution, and development projects.

GEOG 340 Geomorphology (3) Survey of the world's landforms. Frequency of occurrence and implications for land utilization. Coastal, fluvial, glacial and wind generated landforms in different environmental settings. Landform regions of Maryland.

GEOG 345 Climatology (3) The geographic aspects of climate with emphasis on energy-moisture budgets, steady-state and non-steady-state climatology, and climatic variations at both macro and micro-scales.

GEOG 347 The Physical Environment of Urban Areas (3) The constraints imposed upon urban land use by such environmental factors as geology, geomorphology and hydrology. The effects of urban land use upon climatology, soils, earth processes, water movement and vegetation.

GEOG 350 The American City: Past and Present (3) Development of the American city from the early nineteenth century to the present. The internal structure of contemporary metropolitan areas, the spatial arrangement of residential, commercial, and other activities. Washington, D.C. and Baltimore examples.

GEOG 370 Principles of Cartography (3) One hour of lecture and four hours of laboratory per week. Techniques and problems of compilation, symbolization, design and construction of special purpose maps. Emphasis on the methods of improving map design based on the organization of map components and the proper selection of symbols.

GEOG 372 Remote Sensing (3) Principles of remote sensing in relation to photographic, thermal infra-red and radar imaging. Methods of obtaining quantitative information from remotely-sensed images. Interpretation of remotely-sensed images emphasizing the study of spatial and environmental relationships.

GEOG 373 Computer Mapping (3) Prerequisite: GEOG 370 or CMSC 110. Introduction to the use of computers to produce maps, with emphasis on software packages and algorithms used to produce thematic maps. Mathmatical and perceptual problems of maps produced on line printers, line plotters, and display screens.

GEOG 380 Local Field Course (3) Training in geographic field methods and techniques. Field observation of land use in selected rural and urban areas in Eastern Maryland. One lecture per week with Saturday and occasional weekend field trips. Primarily for undergraduates.

GEOG 384 Internship in Geography (3) Prerequisites: GEOG 305, 310, and permission of department. Corequisite: GEOG 385. Supervised field training to provide career experience. Introduction to professional level activities, demands, opportunities. Placement at a public agency, non-profit organization, or private firm. Participation requires application to the internship advisor in preceding semester.

GEOG 385 Internship Research Paper (3) Prerequisite: GEOG 305, 310, and permission of department. Corequisite: GEOG 384. Seminar conducted on campus. Research paper related to the student's internship.

GEOG 398 Honors Research (3) Student development of a potential research topic under the guidance of a faculty advisor, culminating in a written and oral presentation of a research proposal.

GEOG 399 Honors Thesis (3) Prerequisite: GEOG 398. Second course in departmental honors sequence. Student research under the auspices of a faculty advisor, culminating in a research paper to be defended orally before the geography honors committee.

GEOG 410 Colonial North America (3) The changing geography of the U.S. and Canada from pre-Columbian times to the end of the 18th century. Emphasis on areal variations, and changes in the settlements and economies of Indian and colonial populations. Areal specialization, and the changing patterns of agriculture, industry, trade and transportation. Population growth, composition and interior expansion. Regionalization.

GEOG 411 19th Century North America (3) An analysis of the changing geography of the U. S. and Canada from 1800 to the 1920's. The settlement, expansion and socio-economic development of the U. S. and comparisons with the Canadian experience. Immigration, economic activities, industrialization, transportation and urbanization.

GEOG 414 Historical Geography of the Hispanic World (3) The social, economic, political and cultural geography of the countries of the Iberian peninsula and Latin America in the past with concentration on specific time periods of special significance in the development of these countries.

GEOG 416 Overseas European Colonization and the Third World (3) The impact of European overseas expansion on Africa, Asia and Australasia during the 19th and early 20th centuries. Settlement patterns and territorial organization. Cultural and demographic change. Economic organization of space.

GEOG 420 Cultural Geography (3) Prerequisite: one of the following, GEOG 201 and 202, ANTH 101 and 102; or consent of instructor. The impact of man through his ideas and technology on the evolution of geographic landscapes. Major themes in the relationships between cultures and environments.

GEOG 421 Cultural Ecology (3) Basic issues concerning the natural history of man from the perspective of the geographer. Basic components of selected behavioral and natural systems, their evolution and adaptation, and survival strategies.

GEOG 422 Population Geography (3) The spatial characteristics of population distribution and growth, migration, fertility and mortality from a global perspective. Basic population-environmental relationships; carrying capacity, density, relationships to national development.

GEOG 423 Political Geography (3) Geographical factors in the national power and international relations; an analysis of the role of "geopolitics" and "geostrategy," with special reference to the current world scene.

GEOG 430 Location Theory and Spatial Analysis (3) Theories and procedures for determining the optimal location of industrial, commercial and public facilities. Techniques to evaluate location decisions. The provision of services within regions and metropolitan areas. Emerging trends.

GEOG 433 Transportation Networks (3) The description and modeling of the spatial components of transportation systems. The theory and practice of analysing transportation networks, including nodes, links, routes, flows and regions. Examples drawn from different transportation nodes.

GEOG 434 Agricultural and Rural Development (3) The nature of agricultural resources, the major types of

agricultural exploitation in the world and the geographic conditions. Main problems of conservation.

GEOG 436 Issues in Urban Transportation (3) The spatial patterns of personal travel, movement of goods, and public transit services in cities. Transportation and land use. Public policy issues, transportation access, energy use, and neighborhood disruption. Methods of data collection and analysis, travel demand surveys.

GEOG 440 Process Geomorphology (3) Prerequisite: GEOG 340 or GEOL 340 or consent of instructor. A quantitative investigation of the fundamental geomorphic processes shaping modern landscapes, with emphasis on fluvial, coastal and glacial processes. Field, instrumentation and laboratory analyses.

GEOG 441 Geomorphological Environment (3) Prerequisite: GEOG 201, GEOL 100 or consent of instructor. Analysis of regional geomorphic environments: arctic, alpine, coastal, desert. Fluvial and glacial landscape impacts. Discussion of historical environments.

GEOG 442 Urban Climates (3) Prerequisite: one of the following, GEOG 345, 347, METO 301 or consent of instructor. Effects of cities on their climatic environment. Radiant energy budgets, urban heat islands, precipitation patterns and effects of the urban climate on human activities. Computer simulation of urban climates and field study.

GEOG 446 Applied Climatology (3) Prerequisite: GEOG 345 or consent of instructor. The components of the earth's readiation balance and energy budgets: radiation, soil heat flux and the evaporation process. Measurement and estimation techniques. Practical applications of microclimatological theory and techniques.

GEOG 448 Field and Laboratory Techniques in Environmental Science (1-3) Two lectures and on two-hour laaboratory per week. Prerequisite: one of the following, GEOG 201, GEOL 100, AGRO 105, ENCE 221 or consent of instructor. A variable credit course that introduces field and laboratory analyses in environmental science.

GEOG 450 The Contemporary City (3) The contemporary urban system: towns, cities and metropolitan areas and their role as concentrations of social and economic activity. Patterns of land-use: residential, commercial activity, manufacturing, and transportation. Explanatory and descriptive models. International comparisons.

GEOG 454 Washington: Past and Present (3) The development of the Washington area from its origin as the Federal Capital to its role as a major metropolitan area. The geographic setting, the L'Enfant Plan and its modification, the federal government role, residential and commercial structure. The growth of Washington's suburbs.

GEOG 456 The Social Geography of Metropolitan Areas (3) A socio-spatial approach to man's interaction with his urban environment, the ways people perceive, define, behave in, and structure their cities and metropolitan areas. Spatial patterns of social activities as formed by the distribution and interaction of people and social institutions.

GEOG 457 Historical Geography of North American Cities (3) The urbanization of the United States and Canada prior to 1920. The evolution of the urban system across the countries and the spatial distribution of activities within cities. The process of industrialization and the concurrent structuring of residential patterns among ethnic groups.

GEOG 462 Water Resources and Water Resource Planning (3) Critical concepts in U.S. water resources management emphasis on Federal water policy, water supply, water quality, flood control and water recreation issues. Water resource planning basic concepts and the development of water management plans.

GEOG 463 Geographic Aspects of Pollution (3) Impact of human activities on the environment and resulting pollution problems. The characteristics and spatial aspects of air, water, and land resource problems. Federal legislation and planning techniques to reduce pollution.

GEOG 464 Energy Resources and Planning (3) Regional distribution of energy resources and consumption in the U.S. past and present patterns of energy use. Assessment of the potential of conservation, and nuclear, fossil and renewable energy resources with an emphasis on spatial impact of energy policy desisions.

GEOG 467 Energy Resources and the Environment (3) The effect of energy resource utilization on the physical environment including land use, air and water quality, and solid waste generation. Recent laws designed to reduce environmental impacts. The physical consequences of alternative energy technologies.

GEOG 470 Development of Cartographic Technology (3) The impact of technological improvements in land surveying and maps production of graphic images. The formation, expansion and diffusion of geographic information. Study of cartographic imagery as a changing form of communication.

GEOG 471 Cartographic Production (3) One hour of lecture and four hours of laboratory per week. Map making and modern methods of production and reproduction. Organization of artwork for multicolor or series map production including production planning and quality control.

GEOG 475 Principles of Map Design (3) Prerequisite: GEOG 370. The principles of designing maps for publication in print media, including books and atlases. The selection of symbols, colors, lettering, map projections, and map content. Constraints and problems in the classification and representation of map data.

GEOG 478 Problems in Cartography (3) Prerequisite 6 credit hours in cartography or consent of instructor. Special topics in cartography for advanced students. Problems of cartographic management, special use maps; automated map production; map pattern perception; tabular information from maps; map projections, transformations, and new technologies. Repeatable to a maximum of six credits.

GEOG 480 Advanced Remote Sensing (3) Prerequisite: GEOG 372 or introductory remote sensing in another department. Project-oriented approach to specific applications of remote sensing. Use of numerical, digital data and pictoral images from aircraft and space vehicles. Image display and enhancement. Applications in resources management and environmental studies.

GEOG 481 Advanced Computer Mapping (3) Prerequisite: GEOG 373 or consent of instructor. Advanced concepts in automated cartography. Computerized map projections and displays. Computer assisted map design and symbolization.

GEOG 482 Geographic Information Systems (3) Prerequisite: GEOG 373 or consent of instructor. The construction and use of computer-based information systems. The collection, manipulation and automated display of geographical data. Applications in areas such as resource management, political boundaries, terrain analysis and community planning.

GEOG 483 Survey of Computer Facilities for Geography and Urban Studies (1) The PRIME computer system. Graphics terminals, digitizers, plotters. File creation and use (PRIMOS), software for statistical analysis (MINITAB), relational data base management system (INFO), digitizing (DIGSRF2), contour mapping (SURFACE II), mapping of census data (CHOROMAP), symbol mapping (GIMMS). Other computer facilities on campus.

GEOG 490 Geographic Concepts and Source Materials (3) A comprehensive and systematic survey of geographic concepts designed exclusively for teachers. Stress will be placed upon the philosophy of geography in relation to the social and physical sciences, the use of the primary tools of geography, source materials, and the problems of presenting geographic principles.

GEOG 498 Topical Investigations (1-3) Independent study under individual guidance. Restricted to advanced undergraduate students with credit for at least 24 hours in geography and to graduate students. Any exception should have the approval of the head of the department.

GEOL — Geology

GEOL 100 Physical Geology (3) A general survey of the rocks and minerals composing the earth, its surface features and the agents that form them, and the dynamic forces of plate tectonics. Credit will not be given for both GEOL 100 and GEOL 101.

GEOL 101 Physical Geology for Science Students (3) A basic course in physical geology specifically designed to meet the educational needs of students majoring in the physical or biological sciences. The interrelationships between the internal dynamics of the earth expressed as volcanoes, earthquakes, plate tectonics and mountain building and the surface processes that shape the landscape. Systematic description of rocks and minerals. Credit will not be given for both GEOL 100 and GEOL 101.

GEOL 102 Historical Geology (3) Prerequisite: GEOL 100 or GEOL 101. A study of the earth's history as revealed through the principles of stratigraphy and the processes of physical geology, with emphasis on the formations and the geologic development of the North American continent.

GEOL 110 Physical Geology Laboratory (1) One laboratory a week. Pre- or corequisite GEOL 100 or GEOL 101. The basic materials and tools of physical geology stressing familiarization with rocks and minerals and the use of maps in geologic interpretations.

GEOL 112 Historical Geology Laboratory (1) One laboratory a week. Pre- or corequisite GEOL 100 or GEOL 101. The use of geologic maps and fossils in the study of the physical and biological evolution of the earth.

GEOL 120 Environmental Geology (3) A review of geologic factors underlying many environmental problems and the interactions between population and physical environment: geologic hazards, land-use planning, conservation, mineral resources, waste disposal, land reclamation and the geologic aspects of health and disease. The course is aimed at lower division students in education and liberal arts, and should be useful to any student concerned with geologic perspectives of environmental problems.

GEOL 210 Gems and Gemstones (3) A survey of the origin, occurrances, properties, fashioning, and treatments of natural and synthetic materials, with emphasis on diamonds and colored stones.

GEOL 212 Planetary Geology (3) An examination of the geological and geochemical processes at work in the solar system from the perspectives supplied by space age exploration of the planets and other solar system bodies.

GEOL 301 Evolution in Geology (3) Prerequisites: a college-level physical or biological science course with laboratory. An analysis of data, assumptions and logical structure of seafloor spreading and continental drift, biological evolution and the geological record, the concept of geologic time, catastrophism in geology, and "creationist geology."

GEOL 321 Crystallography (3) Two lectures and one laboratory a week. Prerequisite: MATH 115 or consent of instructor. An introduction to the study of crystals. The theoretical and practical relationships between the internal and external properties of crystalline solids. Morphological, optical and chemical crystallography.

GEOL 322 Mineralogy (4) Two lectures and two laboratories a week. Prerequisite: GEOL 110 and CHEM 103, or consent of instructor. Basic mineralogy for geology majors. The principles of morphologic crystallography, crystal chemistry, and determinative mineralogy.

GEOL 331 Invertebrate Paleontology (4) Three lectures and one laboratory a week. Prerequisite: GEOL 102 or consent of instructor. A systematic review of the morphology, classification, interrelationships and geologic significance of all the commonly fossilized invertebrate phyla.

GEOL 340 Geomorphology (4) Three lectures and one laboratory per week. Two Saturday field trips. Prerequisites: GEOL 100 or GEOL 101, and GEOL 110. A systematic analysis of landforms, organized on the basis of the geological processes that have operated during the late Cenozoic. The development and evolution of constructional as well as erosional landforms are descriptively and quantitatively related to physical systems operating on geologic structures through time.

GEOL 341 Structural Geology (4) Three lectures and one laboratory a week. Prerequisite: GEOL 110 and 112, or consent of instructor. An examination of the deformation of the earths crust, stress and strain, mechanical behavior of rocks origin and significance of structural features. Construction of geologic maps and

cross sections, stereographic and orthographic representation of structures.

GEOL 342 Sedimentation (4) Two lectures and one laboratory a week. Prerequisite: GEOL 322 or consent of instructor. A study of the critical variables in sedimentation systems, origin, dispersion accumulation, and properties of sediments and sedimentary rocks. Laboratory exercises include the quantitative estimation of composition and textural parameters of sediments, the description and petrologic interpretation of representive sedimentary rocks, and field laboratory problem. A three-day field trip is required.

GEOL 393 Technical Writing for Geoscientists (3) Prerequisite: ENGL 101 and completion of any two of the following and concurrent registration in the third: GEOL 341, GEOL 331 and GEOL 322. Open only to geology majors. Planning, writing and presenting a plan for research in the geosciences.

GEOL 394 Research Problems in Geology (3) Prerequisite: GEOL 393. Investigation of a specific laboratory, library or field problem. Written and oral presentation of the study.

GEOL 410 Industrial Rocks and Minerals (3) Prerequisite: GEOL 322 or consent of instructor. The origin, occurrence, mineralogy, extraction and treatment technology, production and deposit-evaluation of rocks and minerals used in the construction, ceramic, chemical and allied industries. Restricted to non-fuels, non-metallic, non-gem materials. Field trips to industrial locations are required.

GEOL 423 Optical Mineralogy (3) One lecture and two laboratories a week. Prerequisite: GEOL 322 or consent of instructor. The optical behavior of crystals with emphasis on the theory and application of the petrographic microscope.

GEOL 432 Stratigraphic Paleontology (3) Two lectures and one laboratory a week. Prerequisite: GEOL 331. Principles of biostratigraphy, paleoecology and paleogeography. Laboratory study emphasizes significant index fossils.

GEOL 434 Micropaleontology (3) Two lectures and one laboratory a week. Prerequisite: GEOL 331 or consent of instructor. A systematic review of the morphology, classification, ecology and geologic ranges of important microfossil groups, particularly ostracoses and foraminifera.

GEOL 436 Regional Geology of North America (3) Prerequisite: GEOL 102 or consent of the instructor. A systematic study of the regional geology of North America including history, structure, stratigraphy and petrology of the physiographic provinces of the United States, Canada and the Caribbean.

GEOL 443 Petrology (3) Prerequisite: GEOL 322 or consent of instructor. Two lectures and one laboratory per week. A detailed study of rocks: petrogenesis; distributions, chemical and mineralogical relation; macroscopic descriptions and geologic significance.

GEOL 444 Petrography (3) One lecture and two laboratories a week. Prerequisites: GEOL 423, 342 or consent of instructor. Microscopic thin-section studies of rocks stressing the description and classification of igneous and metamorphic rocks.

GEOL 445 Principles of Geochemistry (3) Prerequisites: CHEM 103 and GEOL 322. An introduction to the basic principles of geochemistry including geothermometry, geobarometry, geochronology and the genesis of natural inorganic materials.

GEOL 446 Geophysics (3) Two lectures and one laboratory a week. Prerequisite: PHYS 142 or consent of instructor. An introduction to the basic theories and principles of geophysics stressing such important applications as rock magnetism, gravity anomolies, crustal strain and earthquakes, and surveying.

GEOL 447 Geochemistry of Fuels (3) Prerequisite: CHEM 104 or consent of instructor. Discussion of the progenitors and the biochemical, chemical and physical agencies that convert them into crude oils, coals of various ranks, natural gas and other organic fuels. The origin, composition, mineralogy and organic constituents (kerogen) of oil shales. Mineralogy, geochemical cycles and accumulation of uranium and thorium.

GEOL 450 Economic Geology of Energy Sources (3) Problems related to current methods for exploration for and recovery of crude oils, coals, asphalts, tar sands, oil shales, gas, uranium, and geothermal energy. Geological, geochemical engineering, economic and environmental considerations.

GEOL 451 Groundwater Geology (3) Prerequisite: GEOL 100 or GEOL 101 or consent of instructor. An introduction to the basic geologic parameters associated with the hydrologic cycle. Problems in the accumulation, distribution and movement of groundwater will be analyzed.

GEOL 453 Economic Geology (3) Two laboratories a week. Prerequisite: GEOL 322 or consent of instructor. A study of the geology of metallic ore deposits stressing ore-forming processes, configuration of important ore bodies, and familiarization with characteristic ore mineral suites.

GEOL 454 Petroleum Geology (3) Prerequisite: GEOL 341. The occurrence of petroleum, the reservoir, fluids in the reservoir, and preliminary consideration of reservoir dynamics based upon temperature and pressure. Special emphasis on reservoir sedimentology, the role of water in the behavior of constituent clays, and techniques of wireline logging of subsurface lithologies.

GEOL 456 Engineering Geology (3) Prerequisite: GEOL 341 or consent of the instructor. Two lectures and one laboratory a week. A study of the geological problems associated with the location of tunnels, bridges, dams and nuclear reactors, slope control, and natural hazards.

GEOL 462 Geological Remote Sensing (3) One lecture and two laboratories a week. Prerequisites: GEOL 341 and 342, or consent of the instructor. An introduction to geological remote sensing including applications of aerial photographic interpretation to problems in regional geology, engineering geology, structural geology, and stratigraphy. Films, filters, and criteria used in selecting imagery are also discussed. Laboratory exercises include measurements of geologic parameters and compilation and transference of data to base maps.

GEOL 471 Geochemical Methods of Analysis (3) Prerequisite: CHEM 103 AND 113. Principles and application of geochemical analysis as applied to a variety of geological problems. X-ray and optical spectroscopy, X-ray diffraction, atomic absorption, electron microprobe and electron microscopy.

GEOL 472 Tectonics (3) Prerequisite: GEOL 341 or consent of instructor. Selected tectonic elements of organic belts through out the world viewed in the framework of plate tectonics and sea floor spreading.

GEOL 474 Computer Modeling for Geologists (3) Prerequisite: GEOL 331, 341, 342 or 423, CMSC 110. Computer modeling in the geosciences.

GEOL 475 General Oceanography (3) Prerequisite: CHEM 103 or equivalent, and one additional semester of physical science. An introduction to physical, chemical and geological processes that occur in the marine environment including physical and chemical properties of sea water, geology of the sea floor, general circulation of the ocean, currents, waves, and tides.

GEOL 490 Geology Field Camp (6) Prerequisites: GEOL 322, 331 and 341, or consent of instructor. Six weeks of summer field work prior to senior year. Principles and problems in sampling, measuring, mapping, and reporting of geologic data. Group field trips and discussions.

GEOL 499 Special Problems in Geology (1-3) Prerequisites: GEOL 102 AND 110 or equivalent, and consent of instructor. Intensive study of a special geologic subject or technique selected after consultation with instructor. Intended to provide training or instruction not available in other courses which will aid the student's development in his field of major interest.

GERM — German

GERM 001 Elementary German For Graduate Students (3) Intensive elementary course in the German language designed particularly for graduate students who wish to acquire a reading knowledge. This course does not carry credit towards any degree at the University.

GERM 101 Elementary German I (4) Four recitations per week plus one laboratory hour. Introduction to basic structures and pronunciation by emphasis on the four skills: listening, speaking, reading and writing. Readings concern the current life-style and civilization of the German-speaking world.

GERM 102 Elementary German II (4) Four recitations per week plus one laboratory hour. Prerequisite: 101 or equivalent. A continuation of GERM 101, completing the introduction of basic structures and continuing the involvement with the civilization of the German-speaking world.

GERM 103 Review of Elementary German (4) Prerequisite: assignment either by placement examination or by the undergraduate director (Germanic Section). Designed specifically for students who are too advanced for GERM 101 but are not sufficiently prepared to take GERM 102. GERM 103 covers the coursework to the completion of GERM 102 in one semester. Four recitations per week plus one laboratory hour.

GERM 104 Intermediate German (4) Four recitations per week plus one laboratory hour. Prerequisite: GERM 102 or 103 or equivalent. Grammar review and greater mastery of vocabulary, idioms, conversational fluency and compositional skills. Readings stress the current life-style and civilization of the German-speaking world.

GERM 141 Elementary Yiddish I (3) Pronunciation and basic grammatical structures, readings in the life-style and culture of the Yiddish-speaking world.

GERM 142 Elementary Yiddish II (3) Prerequisite: GERM 141 or equivalent. A continuation of GERM 141.

GERM 144 Intermediate Yiddish I (3) Prerequisite: GERM 142 or equivalent. Grammar review and greater mastery of vocabulary, idioms, conversational fluency and compositional skills, readings on Yiddish culture.

GERM 145 Intermediate Yiddish II (3) Prerequisite: GERM 144 or equivalent. Continuation of GERM 144.

GERM 151 Elementary Dutch I (3) Pronunciation and basic grammatical structures, readings in the life-style and civilization of the Dutch-speaking world.

GERM 152 Elementary Dutch II (3) Prerequisite: GERM 151 or equivalent. A continuation of GERM 151.

GERM 154 Intermediate Dutch I (3) Prerequisite: GERM 152 or equivalent. Grammar review and greater mastery of vocabulary, idioms, conversational fluency and compositional skills; readings on Netherlandic civilization.

GERM 155 Intermediate Dutch II (3) Prerequisite: GERM 154 or equivalent. A continuation of GERM 154.

GERM 161 Elementary Danish I (3) Conversational skills in modern Danish.

GERM 162 Elementary Danish II (3) Prerequisite: GERM 161 or equivalent. A continuation of GERM 161.

GERM 163 Elementary Norwegian I (3) Conversational skills in modern Norwegian.

GERM 164 Elementary Norwegian II (3) Prerequisite: GERM 163 or equivalent. A continuation of GERM 163.

GERM 165 Elementary Swedish I (3) Conversational skills in modern Swedish.

GERM 166 Elementary Swedish II (3) Prerequisite: GERM 165 or equivalent. A continuation of GERM 165.

GERM 220 Introduction to German Literature (3) Prerequisite: GERM 114 or equivalent. Reading and discussion of major authors with emphasis on contemporary German literature. Readings and instruction in German. May be taken concurrently with GERM 115.

GERM 261 Intermediate Danish I (3) Prerequisite: GERM 162 or equivalent. Grammar review and greater mastery of vocabulary, idioms, conversational fluency and composition skills; readings of literary texts and magazine or newspaper articles.

GERM 262 Intermediate Danish II (3) Prerequisite: GERM 261 or equivalent. A continuation of GERM 261.

GERM 263 Intermediate Norwegian I (3) Prerequisite: GERM 164 or equivalent. Grammar review and greater mastery of vocabulary, idioms, conversational fluency and composition skills; readings of literary texts and magazine or newspaper articles.

GERM 264 Intermediate Norwegian II (3) Prerequisite: GERM 263 or equivalent. A continuation of GERM 263.

GERM 265 Intermediate Swedish I (3) Prerequisite: GERM 166 or equivalent. Grammar review and greater

mastery of vocabulary, idioms, conversational fluency and composition skills, readings of literary texts and magazine or newspaper articles.

GERM 266 Intermediate Swedish II (3) Prerequisite: GERM 265 or equivalent. A continuation of GERM 265.

GERM 280 German-American Cultural Contrast (3) A study of german-american culture in contemporary literature.

GERM 281 Women in German Literature and Society (3) A study of changing literary images and social roles of women from the beginning of the 19th century to the present.

GERM 282 Germanic Mythology (3) An introduction to the religious beliefs of the pagan Germanic peoples. Comparison of Germanic myths with those of other Indo-European peoples. The conversion of the Germania to Christianity and the preservation of pagan beliefs in superstition and literature.

GERM 285 German Film and Literature (3) A visual approach to German literature through a study of the historical, cultural, and literary significance of German films. Representative examples from the golden age of German silent films to the new German cinema.

GERM 301 Conversation and Composition I (3) Prerequisite: GERM 115 or equivalent. Practice in contemporary spoken and written German. Systematic review of grammar, and exercise in composition. Emphasis on cultural contrasts.

GERM 302 Conversation and Composition II (3) Prerequisite: GERM 301 or equivalent. Continuation of GERM 301.

GERM 321 Highlights of German Literature I (3) Prerequisite: GERM 220 or equivalent. Selected masterworks from different periods of German literature: middle ages, reformation, baroque, 18th century, classicism. Readings and instruction in German.

GERM 322 Highlights of German Literature II (3) Prerequisite: GERM 220 or equivalent. Selected masterworks from different periods of German literature: romanticism, Biedermeier, Junges Deutschland, realism, naturalism and its counter currents, expressionism to the present. Readings and instruction in German.

GERM 339 German Literature in Translation (3) Selected movements, genres or other special topics in German literature. Readings and instruction in English. May be repeated to a maximum of six credits if the subject matter is different. May not be counted in the fulfillment of German major requirements in German literature.

GERM 348 Yiddish Culture (3) Various phases of Yiddish culture ranging from the life-style of European jewry in the "shtetl" to experiences of the immigrant. Readings and instruction in English. Repeatable to a maximum of 6 credits if subject matter is different.

GERM 349 Yiddish Literature in Translation (3) Study of an important Yiddish author, period or theme. Readings and instruction in English. Repeatable to a maximum of 6 credits if subject matter is different.

GERM 358 Netherlandic Civilization (3) The literary, scientific and artistic traditions, great men and women, customs and general culture of the Netherlands and Flemish-speaking Belgium, or specific study of a period, feature or concern of Netherlandic civilization. All readings and instruction in English. May be repeated up to a maximum of six credits if subject matter is different.

GERM 359 Netherlandic Literature in Translation (3) Study of a major Netherlandic author, genre, period or theme. Readings and instruction in English. Repeatable to a maximum of six credits if subject matter is different.

GERM 368 Scandinavian Civilization (3) Literary, artistic and historic traditions, folklore and superstition, customs and life-style shared by Scandinavian nations. Readings and instruction in English. Repeatable to a maximum of 6 credits if subject matter is different.

GERM 369 Scandinavian Literature in Translation (3) Study of a major Scandinavian author, genre, period or theme. Readings and instruction in English. Repeatable to a maximum of 6 credits if subject matter is different.

GERM 381 German Civilization I (3) A survey of the literary, educational and artistic traditions, great men and women, customs and general culture of the German-speaking world from the beginnings to the middle of the 19th century. All readings and instruction are in English.

GERM 382 German Civilization II (3) A continuation of GERM 381 covering the development of German, Austrian and Swiss civilizations from the middle of the 19th century to the present. All readings and instruction are in English.

GERM 383 The Viking Era (3) An introduction to the lifestyle of northern Europe in the 9th to 11th centuries. Readings and instruction in English.

GERM 384 The Age of Chivalry (3) An introduction to the lifestyle of northern Europe in the 12th to 14th centuries. Readings and instruction in English.

GERM 389 Topics in Germanic Culture (3) Topics in the cultures of the German, Germanic, Indo-European peoples and of their culturally related non-Indo-European neighbors. In English. Repeatable to a maximum of six credits if subject matter is different.

GERM 397 Honors Reading (Independent Study) (3) Supervised reading to be taken normally only by students admitted into honors program.

GERM 398 Honors Reading Course (3) Discussion of a central theme with related investigations by students. Conducted in German.

GERM 401 Advanced Conversation (3) Prerequisite: GERM 302 or equivalent. Development of fluency in spoken German. Discussion of contemporary issues.

GERM 403 Advanced Composition (3) Prerequisite: GERM 302 or equivalent. Advanced instruction in writing skills.

GERM 405 Stylistics (3) Prerequisite: GERM 302 or equivalent. Stylistic analysis of oral and written German both literary and non-literary. Intensive study of vocabulary and syntax. Dictionary and composition exercises.

GERM 415 German/English Translation I (3) An intensive presentation of German grammar limited exclusively to reading skill; graded readings in the arts and sciences. Instruction in English; can not be used to satisfy the arts and humanities foreign language requirement. May not be taken for credit by students who have completed GERM 111-115 and/or GERM 301/302.

GERM 416 German/English Translation II (3) Prerequisites: GERM 302, GERM 415 or equivalent. Written translation of materials from the student's field of study. Discussion of basic problems of German-to-English translation, with examples from students' projects. Instruction in English. Cannot be used to satisfy the arts and humanities foreign language requirement.

GERM 418 Practicum in German/English Translation (3) Prerequisite: GERM 416 or equivalent. Problems of professional translating from German into English, translation of literary and technical texts, the assembling and use of a specialized translator's reference library. May be repeated up to a maximum of six credits.

GERM 419 Selected Topics in German Language Study (3) Prerequisite: GERM 302 and consent of instructor. Repeatable to a maximum of six credits if subject matter is different.

GERM 421 Literature of the Middle Ages (3) Prerequisites: GERM 321 and 322, or permission of instructor. German literature from the 8th through the 15th centuries. Readings include old high German texts, the German heroic, courtly and popular epic, Minnesang, Meistersang, the late Medieval epic, folk literature of the late Middle Ages. Read in modern German translation.

GERM 422 From the Reformation Through the Baroque (3) Prerequisites: GERM 321 AND 322, or permission of instructor. Readings of representative authors from the reformation and the period of humanism through the baroque (ca. 1517-1720). Readings and instruction in German.

GERM 423 From Enlightenment through Storm and Stress (3) Prerequisites: GERM 321 and 322, or permission of instructor. Readings of representative authors from the Enlightenment (1720-1785), the Age of Sentimentalism (1740-1780) and Storm and Stress (1767-1785). Readings and instruction in German.

GERM 424 Classicism (3) Prerequisites: GERM 321 and 322 or permission of instructor. Readings of representative authors from the Age of Classicism (1786-1832). Readings and instruction in German.

GERM 431 Romanticism and Biedermeier (3) Prerequisites: GERM 321 and 322 or permission of instructor. Readings of representative authors from the periods of Romanticism (1798-1835) and Biedermeier (1820-1850). Readings and instruction in German.

GERM 432 Junges Deutschland and Realism (3) Prerequisite: GERM 321 and 322 or permission of instructor. Readings of representative authors from the periods of Junges Deutschland (1830-1850) and Realism (1850-1890). Readings and instruction in German.

GERM 433 Naturalism and Its Counter Currents (3) Prerequisites: GERM 321 and 322 or permission of instructor. Readings of representative authors from the period of naturalism and its counter currents (1880-1920). Readings and instruction in German.

GERM 434 Expressionism to 1945 (3) Prerequisites: GERM 321 AND 322, or permission of instructor. Readings of representative authors from Expressionism through the period between the wars to the contrast of Nazi and Exile Literature (ca. 1910-1945). Readings and instruction in German.

GERM 435 From 1945 to the Present (3) Prerequisite: GERM 321 and 322, or permission of instructor. Readings of representative authors from the "Two Germanies," Austria, and Switzerland in the period from the end of World War II to the present. Readings and instruction in German.

GERM 439 Selected Topics in German Literature (3) Prerequisites: GERM 321 AND 322, or permission of instructor. Specialized study of an author, school, genre, or theme. Repeatable to a maximum of six credits if subject matter is different. Readings and instruction in German.

GERM 449 Selected Topics in Yiddish Studies (3) Prerequisite: Permission of instructor. Study of a linguistic, literary or cultural topic in Yiddish studies. Repeatable to a maximum of 6 credits if subject matter is different.

GERM 459 Selected Topics in Netherlandic Studies (3) Prerequisite: consent of instructor. Study of a linguistic, literary or cultural topic in Netherlandic Studies. Repeatable to a maximum of six credits if subject matter is different.

GERM 461 Reading Swedish, Danish and Norwegian I (3) Develops reading facility in three languages in one semester. Texts read include Bergman's Seventh Seal, tales by H.C. Andersen, excerpts from works by Ibsen and Hamsun, and selected folk literature. No foreign language prerequisite. Not available for credit to students who have taken GERM 164 or GERM 165.

GERM 462 Reading Swedish, Danish and Norwegian II (3) Prerequisite: GERM 461 or permission of instructor. Further development of reading facility.

GERM 463 The Icelandic Family Saga (3) Analysis of the old Norse saga as historiography, literature, and folklore. Readings and instruction in English.

GERM 464 The Fantastic and Historic Saga (3) Mythological/heroic sagas, translation of chivalric materials from the continent, and the histories of the Norwegian kings, the "viking colonies" and the settlement of Iceland contrasted with the classical structure of the family saga, chivalric models, and other national histories by Germanic writers of the Middle Ages. Readings and instruction in English.

GERM 469 Selected Topics in Scandinavian Studies (3) Prerequisite: Permission of instructor. Study of a linguistic, literary or cultural topic in Scandinavian studies. Repeatable to a maximum of 6 credits if subject matter is different.

GERM 472 Introduction to Germanic Philology (3) Prerequisites: GERM 115 and GERM 471, or equivalent. Reconstructed proto-Germanic and surveys of Gothic, Old Norse, Old English, Old Saxon. The development of High German from the Old High German period through Middle High German to modern German; a short introduction to modern German dialectology. Instruction in English.

GERM 475 Old Norse (3) The language of the old Icelandic saga the Eddas and Skaldic poetry. Reading of texts in the original, historical development of Old Norse and its role in the Germanic language family. No knowledge of German or a Scandinavian language required; instruction in English.

GERM 479 Selected Topics in Germanic Philology (3) Prerequisite: consent of instructor. Selected topics such as comparative Germanic studies, Old Norse language or readings in Old Norse literature, modern German dialectology. Repeatable to a maximum of six credits if subject matter is different.

GERM 499 Directed Study (1-3) Prerequisite: by permission of department chairman and/or undergraduate advisor. Repeatable to a maximum of 6 credits if subject matter is different.

GNED — General Education

GNED 100 The Anatomy of Knowing: the University and Its Curriculum (3) An exploration of the ways of understanding the world that characterize the three large areas of university study: the sciences, the social sciences, and the arts and humanities. Students will have the opportunity to develop, in consultation with faculty, their personal plans for intellectual exploration. Open to students with freshman and sophomore standing.

GNED 279 Selected Topics in the Social Sciences (3) A series of student-initiated seminars in the social sciences.

GNED 288 Introduction to British Culture (3) Aspects of British culture they will encounter during their stay in London for students in the Study in London Program. An historical introduction to the development of London, illustrating the city's dominant role in British life and culture. Studies of the different communities, the media, architecture, the relationship between the community and the arts, environmental issues, as well as the political and commercial life of the city.

GNED 289 Selected Topics in the Humanities (3) A series of student-initiated seminars in the humanities.

GNED 299 Selected Topics in the Natural Sciences (3) A series of student-initiated seminars in the natural sciences.

GNED 300 Perspectives on Nuclear War (3) Nuclear weapons are an important issue facing the world today. A multidisciplinary approach to the issue of nuclear war, drawing upon the resources of many departments on campus and organizations off campus. The mechanics of nuclear weapons and delivery systems, and the biological, psychological, medical, and meteorological effects of the use of nuclear weapons. The history of confrontatation, development of arms policies, and efforts at arms control.

GNED 301 The Arts and the Sciences (3) A comparison of the modes of conceptualization and expression characteristic of scientists and creative artists. Examination of such matters as description, style and the relationship of the artist and the scientist to society.

GREK — Greek

GREK 101 Elementary Greek (3) A student who has had two units of Greek in high school may register for GREK 101 for purposes of review, but not for credit.

GREK 102 Elementary Greek (3) A student who has had two units of Greek in high school may register for GREK 102 for credit with departmental permission.

GREK 203 Intermediate Greek (Grammar and Reading) (3) Prerequisite: GREK 101, 102 or equivalent.

GREK 204 Intermediate Greek (Homer) (3) Prerequisite: GREK 203 or equivalent.

GREK 300 level course prerequisite: GREK 204 or equivalent. Except that, with the instructor's permission, a student who plans to take no more than four semesters of Greek may substitute GREK 352 for GREK 204.

GREK 351 Euripides (3)

GREK 352 The New Testament (3)

GREK 353 Herodotus (3)

GREK 354 Greek Lyric Poetry (3) Selections in translation of Greek literature from Homer to Lucian, with special emphasis on epic and dramatic poetry.

GREK 400 level course prerequisite: The status of advanced undergraduate or graduate and consent of the instructor.

GREK 401 Thucydides (3)

GREK 402 Greek Philosophers (3)

GREK 403 Greek Tragedy (3)

GREK 404 Greek Comedy (3)

GREK 405 Greek Oratory (3)

GREK 406 Greek Epigraphy (3)

GREK 488 Independent Study in Greek Language and Literature (1-3) Permission of departmental chairman and instructor required. Repeatable to a maximum of 6 credits.

GREK 499 Greek Readings (3) Prerequisite: consent of the instructor. The reading of one or more selected Greek authors. Reports. May be repeated with different content.

GVPT — Government and Politics

GVPT 100 Principles of Government and Politics (3) A study of the basic principles and concepts of political science. This course may be used to satisfy, in part, the social science requirement in the general education program.

GVPT 170 American Government (3) This course is designed as the basic course in government and it or its equivalent is a prerequisite to other courses in the department as specified in the catalog. It is a comprehensive study of government in the United States-national, state and local.

GVPT 210 Introduction to Public Administration and Policy (3) Prerequisite: GVPT 170. An introduction to the study of the administrative process in the executive branch with an examination of the concepts and principles of administration and their relationship to public policy. The organizational structure, theory and the behavior of participants in the administration of policy.

GVPT 220 Introduction to Political Behavior (3) Prerequisite: GVPT 170. Development, concepts and techniques of the behavioral approach to political science. Comparison with traditional approaches.

GVPT 231 Law and Society (3) Prerequisite: GVPT 170. A study of the basis of law and its relationship with various contemporary institutions such as the courts, police, the legal profession, and society at large.

GVPT 240 Political Ideologies (3) Prerequisite: GVPT 170. A survey and analysis of the leading ideologies of the modern world, including anarchism, communism, socialism, fascism, nationalism, and democracy.

GVPT 260 State and Local Government (3) Prerequisite: GVPT 170. A study of the functioning and problems of state and local government in the United States, with illustrations from Maryland jurisdictions.

GVPT 272 The Politics of Race Relations in the United States (3) Political dimension of historical and contemporary racial cleavage in the United States with particular emphasis on the post World War II period.

GVPT 273 Introduction to Environmental Politics (3) A comprehensive overview of environmental problems, institutions, policies, practices, and remedies found in present-day world society, with special emphasis on environmental matters as objects of American public policy, both domestic and foreign.

GVPT 280 Comparative Politics and Governments (3) An introduction to the field of comparative politics including exposure to the analytic frameworks through which comparative studies of politics and governmental institutions can be undertaken and a survey of the salient types of political systems.

GVPT 282 The Government and Politics of the Third World (3) A study of the governmental institutions, processes and problems, and the socio-economic environment which are common to the great majority of the third world states of Africa, The Middle East, Asia, and Latin America, and in which internal politics develop.

GVPT 300 International Political Relations (3) A study of the major factors underlying international relations, the methods of conducting foreign relations, the foreign policies of the major powers, and the means of avoiding or alleviating international conflicts. This course may be used to satisfy, in part, the social science requirement in general education program.

GVPT 306 Global Ecopolitics (3) Prerequisite: GVPT 170. Consideration of global problems such as the growth controversy, agricultural productivity, pollution, resource depletion, the energy crisis, and the general impact of science and technology on the world ecological, socio-economic, and political system, with particular emphasis on such matters as objects of public policy.

GVPT 341 Political Morality and Political Action (3) Prerequisite: GVPT 100. The ethical problems implicit in public actions by individuals, groups, and government. Selected topics in contemporary political theory such as distribution, participation, and equality.

GVPT 343 Political Themes in Contemporary Literature (3) An analysis of political concepts and issues in novels, plays and poetry drawn largely from the twentieth century. Among the themes considered in the course are the nature and limits of power, conflict, leadership, submissiveness, rebellion, and loyalty.

GVPT 375 Academic Field Research in Government and Politics (6) Field research is based on the data gathered by the student during his internship assignment. Students conduct a major research project on a subject of interest to modern, theoretical political science based on a research design approved by an academic adviser. The course is open only to GVPT majors and intended to be taken concurrently with GVPT 377. The research conducted under GVPT 375 will be substantially different from the project done for GVPT 376.

GVPT 376 Applied Field Research in Government and Politics (6) Students in this course participate as interns in an agency of government or in some other appropriate political organization. Assignments are arranged to provide students with insights into both theoretical and practical aspects of politics. Under the tutelage of the host agency and an academic adviser, students conduct a major research project of mutual interest to the student and his host agency in the field of government and politics. The course is open only to GVPT majors and must be taken concurrently with GVPT 377.

GVPT 377 Seminar For Academic Interns (3) This seminar stresses the application of major concepts of political science as they apply to the realities of the political process. Readings and discussion attempt to relate the experiences of the academic interns to appropriate literature on the subject of political decision-making. This course is open only to GVPT majors and is intended for students concurrently enrolled in GVPT 376 and/or 375.

GVPT 388 Topical Investigations (3) Independent research and writing on selected topics in government and politics. Prerequisite of upper division standing and consent of the instructor. This course may be taken not more than twice for academic credit towards graduation.

GVPT 390 Honors Seminar in American Government and Public Administration (3) Prerequisite: admission to honors program. Directed reading, reporting and discussion on the major materials of historical and contemporary relevance in the fields of American government and public administration.

GVPT 391 Honors Seminar in Comparative Government and International Relations (3) Prerequisite: admission to honors program. Directed reading, reporting and discussion centering on the major materials of historical and contemporary relevance in the fields of comparative government and international relations.

GVPT 392 Honors Seminar in Public Law and Political Theory (3) Prerequisite: admission to honors program. Directed reading, reporting and discussion centering on the major materials of historical and contemporary relevance in the fields of public law and political theory.

GVPT 393 Honors Seminar in Public Policy, Political Behavior, and Methodology (3) Prerequisite: admission to honors program. Directed reading, reporting and discussion centering on the major materials of historical

and contemporary relevance in the fields of public policy and political behavior.

GVPT 396 Introduction to Political Research (3) A required course for all honors students designed to emphasize library, research, methodology, and writing skills in political science and political philosophy. A written proposal, bibliography and research design for an honors paper required of all students as a final project. GVPT 396 should normally be taken in the junior year.

GVPT 397 Honors Research (3) Prerequisite: admission to GVPT honors program and GVPT 396. Individual reading and research. Preparation of an original paper.

GVPT 399 Seminar in Government and Politics (3) Reading, research, discussion, analysis, and writing in the area of politics. Both substantive issues and methodological approaches will be considered. Primarily for government and politics undergraduate majors. Not open to graduate students.

GVPT 401 Problems of World Politics (3) Prerequisite: GVPT 170. A study of governmental problems of international scope, such as causes of war, problems of neutrality, and propaganda. Students are required to report on readings from current literature.

GVPT 402 International Law (3) Prerequisite: GVPT 170. A study of the basic character, general principles and specific rules of international law, with emphasis on recent and contemporary trends in the field and its relation to other aspects of international affairs.

GVPT 403 Law, Morality and War (3) Prerequisite: GVPT 300 or 401 or PHIL 142 or consent of instructor. An exploration of fundamental moral and legal issues concerning war. Also offered as PHIL 403.

GVPT 405 Defense Policy and Arms Control (3) Prerequisite: GVPT 170 or consent of instructor. Contemporary issues of military strategy and international security are covered, including: nuclear war, conventional (limited) war, guerrilla insurgency, arms control, disarmament, moderation of war, defense policy processes, and defense economics.

GVPT 411 Public Personnel Administration (3) Prerequisite: GVPT 410 or BMGT 360. A survey of public personnel administration, including the development of merit civil service, the personnel agency, classification, recruitment, examination techniques, promotion, service ratings, training, discipline, employee relations, and retirement.

GVPT 412 Public Financial Administration (3) Prerequisite: GVPT 410 or ECON 450. A survey of governmental financial procedures, including processes of current and capital budgeting, the administration of public borrowing, the techniques of public purchasing, and the machinery of control through pre-audit and post-audit.

GVPT 413 Governmental Organization and Management (3) Prerequisite: GVPT 410. A study of the theories of organization and management in American government with emphasis on new trends, experiments and reorganizations.

GVPT 414 Administrative Law (3) Prerequisite: GVPT 170. A study of the discretion exercised by administrative agencies, including analysis of their functions, their powers over persons and property, their procedures, and judicial sanctions and controls.

GVPT 417 Comparative Study of Public Administration (3) Prerequisite: GVPT 280 or 410, or consent of instructor. An introduction to the study of governmental administrative systems viewed from the standpoint of comparative typologies and theoretical schemes useful in cross-national comparisons and empirical studies of the politics of the administrative process in several nations. Both western and non-western countries are included.

GVPT 422 Quantitative Political Analysis (3) Prerequisite: GVPT 220, or consent of instructor. Introduction to quantitative methods of data analysis, including selected statistical methods, block analysis, content analysis, and scale construction.

GVPT 423 Elections and Electoral Behavior (3) Prerequisite: GVPT 170 or consent of instructor. An examination of various topics relating to elections the focus includes the legal structure under which elections are conducted, the selection and nomination process, the conduct of election campaigns, and patterns of political participation and voting choice in different types of elections.

GVPT 426 Public Opinion (3) Prerequisite: GVPT 170. An examination of public opinion and its effect on political action, with emphasis on opinion formation and measurement, propaganda and pressure groups.

GVPT 427 Political Sociology (3) Prerequisite: GVPT 220, or consent of instructor. A study of the societal aspects of political life including selected aspects of the sociology of group formation and group dynamics, political association, community integration and political behavior presented in the context of the societal environments of political systems.

GVPT 429 Problems in Political Behavior (3) Prerequisite: GVPT 170. The problem approach to political behavior with emphasis on theoretical and empirical studies on selected aspects of the political process.

GVPT 431 Introduction to Constitutional Law (3) Prerequisite: GVPT 170. A systematic inquiry into the general principles of the American constitutional system, with special reference to the role of the judiciary in the interpretation and enforcement of the federal constitution.

GVPT 432 Civil Rights and the Constitution (3) Prerequisite: GVPT 431. A study of civil rights in the American constitutional context, emphasizing freedom of religion, freedom of expression, minority discrimination, and the rights of defendants.

GVPT 433 The Judicial Process (3) Prerequisite: GVPT 170. An examination of judicial organization in the United States at all levels of government, with some emphasis on legal reasoning, legal research and court procedures.

GVPT 434 Race Relations and Public Law (3) Prerequisite: GVPT 170. A political and legal examination of the constitutionally protected rights affecting racial minorities and of the constitutional power of the federal courts, congress, and the executive to define, protect and extend these rights.

GVPT 435 Judicial Behavior (3) A study of judicial decision making at the state and national levels, drawing primarily on the more recent quantitative and behavioral literature.

GVPT 436 The Legal Status of Women (3) Prerequisite: GVPT 170. An examination of judicial interpretation and application of common, statutory, and constitutional law as these affect the status of women in American society.

GVPT 441 History of Political Theory: Ancient and Medieval (3) Prerequisite: GVPT 100. A survey of the principal political theories set forth in the works of writers before Machiavelli.

GVPT 442 History of Political Theory—Medieval to Recent (3) Prerequisite: GVPT 100. A survey of the principal theorists set forth in the works of writers from Michiavelli to J. S. Mill.

GVPT 443 Contemporary Political Theory (3) Prerequisite: GVPT 441 OR 442. A survey of the principal political theories and ideologies from Karl Marx to the present.

GVPT 444 American Political Theory (3) Prerequisite: GVPT 170. A study of the development and growth of American political concepts from the Colonial period to the present.

GVPT 445 Russian Political Thought (3) Prerequisite: GVPT 170. A survey and analysis of political ideas in Russia and the Soviet Union from early times to the present.

GVPT 448 Non-Western Political Thought (3) Examination of works by major authors and general themes of political thought originating in Asia, the Middle East, and Africa. This is not a survey of all non-western political thought, but a course to be limited by the professor with each offering. When repeated by a student, consent of instructor is required.

GVPT 450 Comparative Study of Foreign Policy Formation (3) Prerequisite: GVPT 280 or 300, or consent of instructor. An introduction to the comparative study of foreign policy formation structures and processes followed by a survey of the domestic sources of policy for major states. A conspectus of substantive patterns of foreign policy in analytically salient types of systems is presented. Domestic and global systemic sources of foreign policy are compared.

GVPT 451 Foreign Policy of the U.S.S.R. (3) Prerequisite: GVPT 170. A study of the development of the foreign policy of the Soviet Union, with attention paid to the forces and conditions that make for continuities and changes from Tsarist policies.

GVPT 452 Inter-American Relations (3) Prerequisite: GVPT 170. An analytical and historical study of the Latin-American policies of the United States and of problems in our relations with individual countries, with emphasis on recent developments.

GVPT 453 Recent East Asian Politics (3) Prerequisite: GVPT 170. The background and interpretation of recent political events in East Asia and their influence on world politics.

GVPT 454 Contemporary African Politics (3) Prerequisite: GVPT 170. A survey of contemporary development in the international politics of Africa, with special emphasis on the role of an emerging Africa in world affairs.

GVPT 455 Contemporary Middle Eastern Politics (3) Prerequisite: GVPT 170. A survey of contemporary development in the international politics of the Middle East, with special emphasis on the role of emerging Middle East nations in world affairs.

GVPT 457 American Foreign Relations (3) Prerequisite: GVPT 170. The principles and machinery of the conduct of American foreign relations, with emphasis on the department of state and the foreign service, and an analysis of the major foreign policies of the United States.

GVPT 460 State and Local Administration (3) Prerequisite: GVPT 170. A study of the administrative structure, procedures and policies of state and local governments with special emphasis on the state level and on intergovernmental relationships, and with illustrations from Maryland governmental arrangments.

GVPT 461 Metropolitan Administration (3) Prerequisite: GVPT 170. An examination of administrative problems relating to public services, planning and coordination in a metropolitan environment.

GVPT 462 Urban Politics (3) Urban political process and institutions considered in the light of changing social and economic conditions.

GVPT 471 Women and Politics (3) Prerequisite: GVPT 170 or permission of instructor. An examination of patterns of political participation among women and of problems of public policy especially relevant to women.

GVPT 473 Legislatures and Legislation (3) Prerequisite: GVPT 170. A comprehensive study of legislative organization procedure and problems. The course includes opportunities for student contact with Congress and with the legislature of Maryland.

GVPT 474 Political Parties (3) Prerequisite: GVPT 170. A descriptive and analytical examination of American political parties, nominations, elections, and political leadership.

GVPT 475 The Presidency and the Executive Branch (3) Prerequisite: GVPT 170. An examination of the executive, legislative and party roles of the president in the political process.

GVPT 479 Problems of American Public Policy (3) Prerequisite: GVPT 170. The background and interpretation of various factors which affect the formation and execution of American public policy.

GVPT 480 Comparative Political Systems (3) Prerequisite: GVPT 280 and at least one other course in comparative government. A study along functional lines, of major political institutions such as legislatures, executives, courts, bureaucracies, public organizations, and political parties.

GVPT 481 Government and Administration of the Soviet Union (3) Prerequisite: GVPT 170. A study of the adoption of the communist philosophy by the Soviet Union, of its governmental structure and of the administration of government policy in the Soviet Union.

GVPT 482 Government and Politics of Latin America (3) Prerequisite: GVPT 170. A comparative study of the governmental systems and political processes of the Latin American countries, with special emphasis on Argentina, Brazil, Chile, and Mexico.

GVPT 483 Government and Politics of Asia (3) Prerequisite: GVPT 280 or 453, or HIST 261, or 262 or HIFN 442, or 445. A comparative study of the political systems of China, Japan, India and other selected Asian countries.

GVPT 484 Government and Politics of Africa (3) Prerequisite: GVPT 170. A comparative study of the governmental systems and political processes of the African countries, with special emphasis on the problems of nation-building in emergent countries.

GVPT 485 Government and Politics of the Middle East (3) Prerequisite: GVPT 170. A comparative study of the governmental systems and political processes of the Middle Eastern countries, with special emphasis on the problems of nation-building in emergent countries.

GVPT 486 Comparative Studies in European Politics (3) Prerequisite: GVPT 280, or consent of instructor. A comparative study of political processes and governmental forms in selected European countries.

GVPT 487 The Government and Politics of South Asia (3) Political systems and governments of such countries as India, Pakistan, BanglaDesh, Ceylon, and Nepal.

GVPT 492 The Comparative Politics of Race Relations (3) Impact of government and politics on race relations in various parts of the world. The origins, problems, and manifestations of such racial policies as segregation, apartheid, integration, assimilation, partnership, and nonracialism will be analyzed.

HEBR — Hebrew

HEBR 101 Intensive Elementary Hebrew (4) Five hours per week. Limited to students with no reading knowledge of Hebrew. Modern Israeli Hebrew. Emphasis on conversation. Study of linguistic structure and development of audio-lingual, writing and reading ability. Credit may not be earned for both HEBR 101 and HEBR 111.

HEBR 111 Elementary Hebrew I (6) Six recitations per week. Modern Israeli Hebrew. Emphasis on conversation. Study of linguistic structure and development of audio-lingual, writing and reading ability.

HEBR 112 Elementary Hebrew II (6) Prerequisite: HEBR 111 or equivalent. Six recitations per week. Continuation of HEBR 111.

HEBR 211 Intermediate Hebrew I (6) Six recitations per week. Prerequisite: HEBR 112 or equivalent. Study of linguistic structure, further development of audio-lingual, reading, writing, and speaking skills. Reading of texts and newspapers designed to give some knowledge of Hebrew life, thought and culture.

HEBR 212 Intermediate Hebrew II (6) Six recitations per week. Prerequisite: HEBR 211 or equivalent. Continuation of HEBR C21.

HEBR 223 The Hebrew Bible: Narrative (3) Selected readings from narrative sections of the Hebrew Bible stressing the new literary approaches to the biblical text. In English, no knowledge of Hebrew required.

HEBR 224 The Hebrew Bible: Poetry and Rhetoric (3) Readings of poetic and prophetic selections from the Hebrew Bible. Analysis of devices and their rhetorical effect. Comparison of biblical poetry with other poetry of the ancient near east. In English; no knowledge of Hebrew required.

HEBR 231 Jewish Literature in Translation (3) Selections from the Bible, Talmud, medieval, and modern sources illustrating the basis and diversity of Jewish thought.

HEBR 298 Special Topics in Jewish Studies (3) Prerequisite: as announced in the "Schedule of Classes" for each topic. Repeatable for six (6) credits, provided the content is different.

HEBR 313 Conversation and Composition I (3) Prerequisite: HEBR 212 or equivalent. A practical language course recommended for all students continuing with Hebrew. Review of grammar and composition. Selected readings. Oral and written exercises.

HEBR 314 Conversation and Composition II (3) Prerequisite: HEBR 313 or equivalent. A practical language course recommended for all students continuing with Hebrew. Review of grammar and composition. Selected readings. Oral and written exercises.

HEBR 321 Survey of Hebrew Literature I (3) Prerequisite: HEBR 301 or equivalent. Haskalah (enlightenment) period. Selections from prose and poetry of Michal, Mapu, Gordon, Mendele. Hebrew Neo-Classicism and Romanticism. Reading in Hebrew. Discussions in Hebrew and in English.

HEBR 322 Survey of Hebrew Literature II (3) Prerequisite: HEBR 301 or equivalent. Hebrew Renaissance Movement from the late 19th century to the Second World War. The writings of Peretz, Bialik, Ahad Haam and Berdichevsky against the background of European Realism, Neo-Romanticism and Symbolism. Readings in Hebrew. Discussions in Hebrew and in English.

HEBR 333 Hebrew Civilization (In English) (3) Trends in the cultural, social and literary history of the Jews from their earliest experiences as a people until Maccabean times. Readings and instruction in English.

HEBR 334 Hebrew Civilization (In English) (3) Trends in the cultural, social and literary history of the Jews from their encounter with Hellenism until the end of the Talmudic era in late antiquity. Readings and instruction in English.

HEBR 381 Advanced Conversation and Composition (3) Prerequisite: HEBR 314 or consent of instructor. Concentrated practice in spoken and written Hebrew.

HEBR 382 Readings in Hebrew Newspapers and Periodicals (3) Prerequisite: HEBR 314 or permission of instructor. Current events, editorials, theatrical reports, book reviews, and scholarly articles. Conducted in Hebrew.

HEBR 401 Introduction to Classical Hebrew I (3) Readings in the Bible and other classical texts in original Hebrew. Emphasis on classical grammar and vocabulary, and reading of textual passages.

HEBR 402 Introduction to Classical Hebrew II (3) Prerequisite: HEBR 401 or equivalent. Continuation of HEBR 401.

HEBR 403 History of the Hebrew Language (3) Prerequisite: HEBR 201 or permission of instructor. Survey of the history of Hebrew from the period of the Bible through modern Israeli Hebrew. Readings in Hebrew.

HEBR 431 Modern Hebrew Literature (3) Prerequisite: HEBR 301 or equivalent. Selected readings from the major Hebrew prose writers of the 20th century such as J. Steinberg, Burla, Berkovitz, Shofman and Agnon describing traditional Jewish life in the Diaspora Milieu and in the land of Israel.

HEBR 432 Contemporary Hebrew Literature (3) Prerequisite: HEBR 301 or equivalent. The problems facing modern man as reflected in the writings of Agnon, Hazaz, Meged, Yehoshua, Amichai, and others. Training in literary criticism. Reading of periodicals dealing with current literary trends.

HEBR 441 Studies in Classical Hebrew and Epigraphy (3) Prerequisite: HEBR 115 or equivalent. Linguistic peculiarities of Classical Hebrew from Pre-Biblical epigraphic records to the Dead Sea Scrolls. Application of the method of literary form criticism to epic poetry and Thanksgiving songs, cultic formulae, historical annals and narratives.

HEBR 442 Classical Hebrew Literature (3) Prerequisite: HEBR 115 or knowledge of Classical Hebrew. Readings in the Hebrew text of the Bible and related texts. Emphasis on the issues and methodology of modern biblical scholarship.

HEBR 471 Readings in Rabbinic Hebrew (3) Prerequisite: HEBR 115 or permission of instructor. Introductory readings in Mishnaic and Talmudic Hebrew texts. Language of instruction English; all texts in Hebrew.

HEBR 472 Readings in Medieval Hebrew (3) Prerequisite: HEBR 115 or permission of instructor. Introductory readings in Medieval Hebrew texts. Language of instruction English; all texts in Hebrew.

HEBR 498 Special Topics in Hebrew (3) Prerequisite: as announced in the Schedule of Classes for each topic. Repeatable for a maximum of six credits provided the content is different.

HESP — Hearing and Speech Sciences

HESP 120 Introduction to Linguistics (3) An introduction to the scientific study of natural language with focus on the basic concepts of phonology, syntax, semantics and pragmatics, with subsequent attention to the applied aspects of linguistic principles.

HESP 202 Introduction to Hearing and Speech Sciences (3) Introduction to phonetics, the physiological bases of speech production and reception, and the physics of sound.

HESP 300 Introduction to Psycholinguistics (3) Prerequisite: HESP 202. An introduction to current theories of language and an investigation of their relationship to human communication behavior. Survey of the experimental literature relating to this question.

HESP 305 Anatomy and Physiology of the Speech Mechanism (3) Prerequisite: HESP 202. Anatomy, physiology, and neurology of speech mechanism.

HESP 311 Anatomy, Pathology and Physiology of the Auditory System (3) Prerequisite: HESP 202. Gross anatomy of the ear and pathways for transmission of sound energy through the peripheral and central auditory system. Causes, development and effects of pathological conditions contributing to temporary or chronic hearing impairments.

HESP 400 Speech and Language Development in Children (3) Prerequisite: HESP 300. Analysis of the normal processes of speech and language development in children.

HESP 401 Introduction to Communication Disorders (3) Disorders of hearing, language and speech for non-majors. Communication disorders in children and adults, with emphasis on etiologies, characteristics, assessment and management.

HESP 402 Speech Pathology I (3) Prerequisite: HESP 300. Etiology, assessment and treatment of language and phonological disorders in children.

HESP 403 Introduction to Phonetic Science (3) Prerequisite: HESP 305. An introduction to physiological, acoustic and perceptual phonetics; broad and narrow phonetic transcription, current models of speech production and perception.

HESP 404 Speech Pathology II (3) Prerequisite: HESP 305. Etiology, assessment and therapeutic management of phonation, resonance, and fluency disorders in children and adults.

HESP 406 Speech Pathology III (3) Prerequisite: HESP 303, 305. Survey of the dysarthrias and aphasias in adults from an interdisciplinary point of view.

HESP 407 Bases of Hearing Science (3) Prerequisite: HESP 311. Fundamentals of hearing including the physics of sound, anatomy and physiology of peripheral and central auditory nervous system, psychophysical procedures used in measurement of auditory sensation and perception and topics in psychological acoustics.

HESP 408 Principles and Methods in Speech-Language Pathology and Audiology (3) Prerequisite: HESP 402, 411. The principles underlying the treatment of speech, language and hearing disorders in children and adults.

HESP 411 Introduction to Audiology (3) Prerequisite: HESP 311. An introduction to the field of audiology. Evaluation and remediation of the hearing-handicapped.

HESP 417 Principles and Methods in Speech-Language Pathology and Audiology (3) Prerequisite: HESP 402, 411. The principles underlying the treatment of speech, language and hearing disorders in children and adults.

HESP 418 Clinical Practice in Speech-Language Pathology and Audiology (3) Prerequisites: HESP 417. Supervised observation with some direct participation in clinical methods for the treatment of disorders of articulation, fluency, child and adult language; evaluation and habilitation/rehabilitation of hearing impaired children and adults. Repeatable to a maximum of six credits.

HESP 438 Seminar: Special Issues in Early Childhood Special Education (1-3)

HESP 498 Seminar (3) Prerequisite: permission of the instructor. Selected topics in human communication and

its disorders. Repeatable to a maximum of six semester hour credits, providing the content is different.

HESP 499 Independent Study (1-3) Prerequisite: permission of instructor. A directed study of selected topics pertaining to human communication and its disorders. May be repeated for a maximum of six semester hour credits.

HIST — History

HIST 101 Great Ideas, Events and Personalities in History (3) An introduction to history including both theories of historical change and detailed specific examples, focusing on crucial events, ideas, or personalities illustrative of that change.

HIST 105 The Jewish Experience (3) An introduction to Jewish history through a study of some major figures or Jewish culture and society. Major themes, ideas, and events of Jewish history from Biblical times until the present.

HIST 106 American Jewish Experience (3) History of the Jews in America from colonial times to the present. Emphasis on the waves of migration from Germany and Eastern Europe; the changing nature of the American Jewish community and its participation in American social, economic and political life.

HIST 108 Biography in History (3) Detailed investigations in the lives, times, and works of important and visible figures in world history; each section usually devoted to a single figure. Concern for both the theory of the individual in history and close examination of the single person. May be repeated to a maximum of six credits hours when topic differs.

HIST 115 Modern Business History (3) Case studies of selected individuals in the business world are used to examine the history of the modern business system from the early modern period to the present. Equal attention to european origins and to the American evolution. Special emphasis on the history of modern corporations and banks and their relations with government and the rest of society.

HIST 130—133 The Emergence of Europe The following sequence of courses taken together constitutes a thorough treatment of the evolution of European civilization. Each course or any series of courses may, however, be taken independently. The courses have been specifically designed for meeting general university requirements.

HIST 130 The Ancient World (3) Interpretation of select literature and art of the ancient Mediterranean world with a view to illuminating the antecedents of modern culture: religion and myth in the ancient near East; Greek philosophical, scientific, and literary invention; and the Roman tradition in politics and administration.

HIST 131 The Medieval World (3) The development of Europe in the Middle Ages, emphasis on the role of religious values in shaping new social, economic, and political institutions. Readings in medieval literature and consideration of monuments in art and architecture.

HIST 132 The Rise of the West: 1500—1789 (3) History of early modern Europe. Emphasis on the developments of the national consciousness of several continental european peoples with references to England and Eastern Europe. Evidence of the growth of state power and bureaucracy, the role of economic institutions, the developments in art, literature, science and religion.

HIST 133 Modern Europe: 1789 - Present (3) Nation-states in Europe since the outbreak of the French revolution. Rapid changes in industrial-economic structure and in demography related to national growths. Emergence of a distinctly modern secular society including "Europeanism" throughout the world. Emphasis on continental, western european countries and peoples, Eastern Europe and Insular Great Britain.

HIST 141 Western Civilization I (3) Recommended for students seeking a two-semester survey course of European history from antiquity to the twentieth century. Political, social, and intellectual developments that form the values and institutions of western world. Ends with the period of reformation. May be taken independently of HIST 142. (Students previously enrolled in HIST 241 not admitted to this course.)

HIST 142 Western Civilization II (3) Recommended for students seeking a two-semester survey course of European history from antiquity to the twentieth century. Begins with period of the reformation and ends with modern times and may be taken independently of HIST 141. (Students previously enrolled in HIST 242 not admitted to this course.)

HIST 144 The Humanities I (3) A survey of man's cultural development from pre-historic times to the Renaissance. Particular emphasis is given to the arts, philosophy, religion, and social conditions which have influenced the common cultural heritage of western civilization. Aspects of the culture of the non-western world included when appropriate. Students previously enrolled in HIST 251 not admitted.

HIST 145 The Humanities II (3) A survey of man's cultural development from the Renaissance to the present. Particular emphasis is given to the arts, philosophy, religion, and social conditions which have influenced the common cultural heritage of western civilization. Aspects of the culture of the non-western world included when appropriate. Students previously enrolled in HIST 252 not admitted.

HIST 156 History of the United States to 1865 (3) A survey of the history of the United States from colonial times to the end of the Civil War. Emphasis on the establishment and development of American institutions.

HIST 157 History of the United States Since 1865 (3) A survey of economic, social, intellectual and political developments since the Civil War. Emphasis on the rise of industry and the emergence of the United States as a world power.

HIST 180 The Chinese World (3) An introduction to China, both traditional and modern. The various aspects of Chinese culture, including the language, family, history, art, and agriculture.

HIST 200 Introduction to the History of Science (3) Survey of some major problems in the development of science. Specific examples of discoveries and theories from the viewpoint of theories of historical change, philosophies of science, and interaction of science with philosophy. Students cannot receive credit for both PHIL 250 and HIST 200.

HIST 201 Science and Technology in World History: Space Time Man Woman (3) Selected topics in the history of science and technology, emphasizing their interest and importance to the public. The topics are united by three main themes: (1) the development of space/time concepts of the universe in astronomy and physics; (2) communications and transportation; (3) the nature of man and woman, including biological, anthropological and psychological theories of race and sex differences.

HIST 206 The Holocaust of European Jewry (3) Roots of Nazi Jewish policy in the 1930's and during World War II; the process of destruction and the implementation of the "final solution of the Jewish problem" in Europe, and the responses made by the Jews to their concentration and annihilation.

HIST 210 Women in America to 1880 (3) An examination of the economic, family and political roles of colonial, slave, immigrant and frontier women in America from pre-industrial colonial period through the early stages of nineteenth century industrialization and urbanization.

HIST 211 Women in America Since 1880 (3) An examination of women's changing roles in working class and middle class families, the effects of industrialization on women's econmic activities and status, and women's involvement in political and social struggles including those for women's rights, birth control, and civil rights.

HIST 212 Women in Western Europe, 1750-Present (3) An analysis of the economic, family, and political roles of European women from 1750 to the present. The effects of industrialization on women's work and status, the demographic parameters of women's lives, and women's participation in political events from market riots to suffrage struggles.

HIST 214 Pre-honors Colloquium in Early American History (3) Selected reading in Early American history with emphasis on independent discussion and writing. May be taken for credit by students exempt from American history. Permission of instructor required.

HIST 215 Pre-honors Colloquium in Modern American History (3) Selected readings in modern American history with emphasis on independent study discussion and writing. May be taken for credit by students exempt from American history. Permission of instructor required.

HIST 219 Special Topics in History (3)

HIST 224 Modern Military History, 1494-1815 (3) Survey of the military history of Europe through an examination of the economic, financial, strategic, tactical, and technological aspects of the development of military institutions and warfare from the dynastic wars of the Valois and Habsburgs to the national wars of the French Revolution and Empire.

HIST 225 Modern Military History, 1815-Present (3) The military history of Europe through an examination of the economic, financial, strategic, tactical, and technological aspects of the development of military institutions and warfare from the Congress of Vienna in 1815 to the present.

HIST 234 History of Britain to 1485 (3) British history from Roman times to the 17th century. The Anglo-Saxon, Scandanavian and Norman invasions, the coming of Christianity, Magna Carta, the development of Parliament, legal institutions and the Common Law, the decline of medieval kingship.

HIST 235 History of Britain 1461 to 1714 (3) British history from the War of the Roses to the Hanoverian succession. Yorkist and Tudor society and politics, the Renaissance and Reformations in England, Henry VIII through Elizabeth, 17th century crises and revolutions; intellectual and cultural changes, the beginnings of empire, the achievement of political and intellectual order.

HIST 236 History of Britain 1688 to Present (3) British history from the Glorious Revolution of 1688 to the present. The revolution of 1688, the structure of 18th century society and politics, economic and social change in the industrial revolution, 19th and 20th century political and social reform, imperialism, the impact of the First and Second World Wars on British society.

HIST 237 Russian Civilization (3) An overview of Russian history stressing the main lines of development of the Russian State and the evolution of Russian culture to the present day.

HIST 250 Latin American History I (3) Latin America from pre-Columbian Indian cultures to the beginnings of the wars for independence (ca. 1810). Covering cultural, political, social, and economic developments.

HIST 251 Latin American History II (3) The republics of Latin America since independence, with special emphasis upon their social economic, and cultural development as third world nations.

HIST 255 Afro-American History (3) A survey of the Negro in American history, covering the African background, slavery, the role of the Negro in the social, political, economic, cultural and artistic life of the United States. Emphasis will be placed on the enduring themes and the black experience in American society, including contemporary problems in race relations.

HIST 264 Social and Cultural History of Early America (3) American social experience from colonial times through the Civil War. The development of colonial societies, the economic and religious bases of 18th century life, the social character of the revolution, the growth of cities, rise of immigration, and maturation of economic enterprise in Antebellum America, and the social causes and consequences of the Civil War.

HIST 265 Social and Cultural History of Modern America (3) American social history from Civil War to the present. Examination of a network of social interaction accompanying the rise of male-dominated, business-oriented urban culture after the Civil War. Concentration on the major social forces clashing and cooperating to produce the modern United States: "business republicanism", urban workers, intellectuals, rural populists, immigrants (especially Jewish), Black Americans, and struggling women liberators. The swift crosscurrents of a "free-society" still wrestling with inherent contradictions of the democratic experiment begun in the American colonies some 350 years ago.

HIST 266 The United States in World Affairs (3) A study of the United States as an emerging world power and the American response to changing status in world affairs. Emphasis on the relationship between internal and external development of the nation.

HIST 280 Islamic Civilization (3) Survey of Islamic civilization dealing with Islam as a religion and covering its major institutions. Begins with pre-Islamic Arabia and

rise of Muhammad, emphasizing the life and political activities of the prophet of Islam, the basic tenets of Islam, and Islamic religious law. A survey of the sectarian development in early Islam is included.

HIST 282 History of the Jewish People I (3) Political, economic, social and cultural development within Jewish history from the Biblical period to the late Middle Ages. Special attention to the emergence of Rabbinic Judaism and its subsequent encounter with medieval Christian and Islamic civilizations. Students who have previously received credit for HIST 354 and HIST 312 may not enroll.

HIST 283 History of the Jewish People II (3) Political, economic, social and cultural development within Jewish history from the end of Middle Ages to the present. Special attention to twentieth century developments including the Nazi holocaust and its aftermath, the Zionist movement and the creation of the State of Israel, rise of the contemporary American Jewish community. Students who have previously received credit for HIST 355 and HIST 313 may not enroll.

HIST 284 East Asian Civilization I (3) An interdisciplinary survey of the development of East Asian cultures. An historical approach drawing on all facets of East Asian traditional life, to gain an appreciation of the fascinatingly different and complex cultures of the area.

HIST 285 East Asian Civilization II (3) A survey of the historical development of Modern Asia since 1700. Primarily concerned with the efforts of east asians to preserve their traditional cultures in the face of western expansion in the eighteenth and nineteenth centuries, and their attempts to survive as nations in the twentieth century.

HIST 290 African Civilization (3) A brief survey of the history of Sub-Saharan Africa from prehistoric times to the end of the colonial era. Special focus on neolithic civilizations, major migrations and political and commercial developments in pre-colonial and colonial Africa.

HIST 301 Women and Industrial Development (3) Analysis of women's role in the industrial state. Emphasis on the process of industrialization and its effect on women's lives since the industrial revolution. Comparisons of women in industrial and non-industrial settings.

HIST 304 Modern Church History (3) Introduction to major developments and problems of modern church history primarily in Europe from the "waning" of the confessional age in the 17th and 18th centuries through the 20th century.

HIST 305 The Eastern Orthodox Church: Its Cultural History (3) A study of the development of the Christian church in the Near East and Eastern Europe from the conversion of constantine to the present. Emphasis will be on the relations between church and state in various periods and on the influence of Eastern Christianity on the cultures of traditionally eastern orthodox nations.

HIST 306 History of Religion in America (3) A history of religion, religious movements, and churches in America from the early colonial period to the present, with special attention to the relation of church and society.

HIST 308 Religion in America: Historical Topics (3) Selected aspects of the American religious experience in detail. May be repeated to a maximum of six semester hours when content differs.

HIST 309 Proseminar in Historical Writing (3) Discussions and research papers designed to acquaint the student with the methods and problems of research and presentation. The student will be encouraged to examine those phases of history which he regards as his specialties.

HIST 310 The Practice of History (3) Prerequisite one course in history. Methods of historical research and presentation. Not open for credit to students majoring in history.

HIST 311 Approaches to the Past (3) Prerequisite: one course in history. Analysis of various theories and schools of historical interpretation. Not open for credit to students majoring in history.

HIST 312 Crisis and Change in the United States (3) Prerequisite one course in history. Major historical crises, controversies, and readjustments in the United States.

HIST 313 Crisis and Change in European Society (3) Prerequisite one course in history. Major historical crises, controversies, and readjustments in European society.

HIST 314 Crisis and Change in the Middle East and Africa (3) Prerequisite one course in history. Major historical crises, controversies, and readjustments in the Middle East and Africa.

HIST 315 Crisis and Change in East Asia (3) Prerequisite one course in history. Major historical crises, controversies, and readjustments in East Asia.

HIST 316 Crisis and Change in Latin America (3) Prerequisite one course in history. Major historical crisis, controversies, and readjustments in Latin America.

HIST 317 The Professions and Society (3) Prerequisite one course in history. The relationship of science, technology, medicine, law, or education to other historical developments and controversies in particular societies.

HIST 319 Special Topics in History (3)

HIST 324 Classical Greece (3) The ancient Greeks from Homer to Socrates, 800-400 B.C. Society and religion of the city-state, the art and literature of Periclean Athens, the Peloponnesian war, and the intellectual circle of Socrates. Not available for students who have taken HIST 420.

HIST 325 Alexander the Great and the Hellenistic Age (3) History of the Greeks 400-30 B.C.: Alexander and the changes he wrought in the Mediterranean world, the rise of monarchies and leagues, new directions in religion, art, literature, and science, and Hellenization of the Near East, including the Jews. Not available for students who have taken HIST 420.

HIST 326 The Roman Republic (3) Ancient Rome 753-44 B.C., From its founding to the assassination of Julius Caesar. Rome's conquest of the Mediterranean world, the social and political forces which brought it about, and the consequent transformation and decline of the republic. Not available for students who have taken HIST 421.

HIST 327 The Roman Empire (3) Roman history from Augustus to Heraclius, 44 B.C.-A.D. 641. The Imperial court and government, the diversity of culture in provinces and cities and the progress of Romanization; Roman religion and its transformation in late antiquity; the Roman army and defense of the frontiers. Not available for students who have taken HIST 421.

HIST 330 Medieval Civilization I (3) Europe from the fall of Rome to the death of Charlemagne. The economic, social and intellectual movements which shaped the civilization of the Latin West, including the rise of Christianity and the church, the creation of a feudal nobility, and the foundation of European states. Developments in art and literature. Readings from sources when available in translation.

HIST 331 Medieval Civilization II (3) Medieval civilization in the 12th and 13th centuries: the Renaissance of the 12th century, the rise of universities, gothic architecture, the European state system, medieval parliaments and scholastic learning and culture. Emphasis on cultural and political developments of the high Middle Ages with study of the principal sources of medieval thought and learning, art and architecture and political theory. Recommended as a sequel to HIST 411.

HIST 332 Europe During the Renaissance and Reformation I (3) Continental Europe from 1450 to 1650: development and spread of Renaissance culture; growth in the powers of central government, economic expansion and beginnings of overseas colonization, division of Western Christendom into two rival religious camps. Particular emphasis on the Protestant and Catholic reformations and their consequences for Europe's political, social, and cultural development. Renaissance and reformation, 1450-1555. The age of religious wars, 1555-1650.

HIST 333 Europe During the Renaissance and Reformation II (3) Continuation of HIST 332.

HIST 334 The Age of Absolutism, 1648-1748 (3) Europe in the age of Louis XIV, with emphasis upon social, religious, and cultural developments.

HIST 335 The Old Regime and the French Revolution, 1748-1815 (3) Europe during the French revolution and Napoleonic period. Intellectual, social, and cultural movements in revolutionary Europe.

HIST 336 Europe in the 19th Century, 1815-1919 (3) The political, economic, social, and cultural development of Europe from the Congress of Vienna to the First World War.

HIST 337 Europe in the World Setting of the 20th Century (3) Political, economic and cultural developments in 20th century Europe with special emphasis on the factors involved in the two world wars and their global impacts and significance.

HIST 340 Eastern Europe Under Communism (3) The evolution of communist regimes and socialist societies in Poland, Czechoslavakia, Hungary, East Germany, Romania and Bulgaria with separate treatment of Yugoslavia. Emphasis on pre-1945 continuity and post-1945 change.

HIST 341 History of Anti-Semitism (3) The historical development of anti-Semitism in its European context. Anti-Semitism both as a set of ideas and as a political movement from the ancient era to the present, with emphasis on the modern era.

HIST 342 Fascism: Theory and Practice (3) The origins and historyy f fascism in Europe, 1918-1945. Emphasis divided between the industrialized (or industrializing) nations and the largely agrarian countries of Europe. The rise of fascism in other parts of the world.

HIST 344 The Russian Revolutions of 1917 (3) A close examination of the historical background, the doctrines, the immediate causes, the events, and the results of the February and October revolutions.

HIST 346 Social and Cultural History of Europe (3) An exploration of social structure, life styles, rituals, symbols, and myths of the peoples of Europe.

HIST 347 History of Crime and Punishment in England (3) Emphasis on the historical development of law enforcement agencies, criminal jurisdictions and trial procedure, 1500-1800. Nature of principle felonies and major trends in crime, penal theory and practice in historical perspective.

HIST 350 History of Baltimore (3) Social, economic, spatial, and political evolution of Baltimore and its inhabitants from first settlement to the present.

HIST 351 Social History of Washington, D.C. (3) Development of the "resident city" of Washington: neighborhoods, schools, places of worship, economic establishments, and local population groups.

HIST 360 American Colonial History (3) Colonial America from Jamestown to 1763. The establishment of the various colonies with emphasis on the reasons for the instability of colonial society to 1689, the emergence of stable societies after 1689, the development of colonial regionalism, political institutions, social divisions, education, urban and frontier problems in the eighteenth century.

HIST 361 The American Revolution (3) The background and course of the American revolution through the formation of the Constitution. Emphasis on the impact of the political movement and war years on the character of American society.

HIST 362 The Formative Period in America, 1789-1824 (3) The evolution of the federal government, the origins of political parties, problems of foreign relations in an era of international conflict, beginnings of the industrial revolution in America, and the birth of Sectionalism.

HIST 363 The Middle Period of American History, 1824-1860 (3) An examination of the political history of the United States from Jackson to Lincoln with particular emphasis on the factors producing Jacksonian Democracy, Manifest Destiny, the Whig Party, the anti-slavery movement, the Republican Party, and Secession.

HIST 364 Reconstruction and the New Nation (3) Sectional and class conflicts and their impact on American life and institutions from the Civil War through the gilded age, social, economic and political reconstruction of the Union; industrialization, urbanization and technological changes.

HIST 365 The Progressive Period: the United States, 1896-1919 (3) How the Wm. McKinley-T.Roosevelt-W.H. Taft-Woodrow Wilson administrations dealt with the trust, money, tariff, and black issues. World War I is treated briefly.

HIST 366 Between the Wars: the United States, 1919-1945 (3) The American way of life in the 1920's and 1930's, the Great Depression, New Deal, and a brief consideration World War II.

HIST 367 The United States Since World War II (3) American history from the inauguration of Harry S. Truman to the present with emphasis upon politics and foreign relations, but with consideration of special topics such as radicalism, conservation, and labor.

HIST 372 Jews and Judaism Under Medieval Islam (3) History of Jews and Judaism from the rise of Mohammed to the 12th century. Economic, political and social developments; special emphasis on Jewish thought illustrated through the writings of Saadia Judah Ha-Levi and Moses Maimonides.

HIST 373 Jews and Judaism Under Medieval Christendom (3) History of Jews and Judaism in Christian lands from Constantine through the 15th century. Intellectual and social relationships between Jews and Christians; medieval anti-semitism; Jewish cultural achievements, the Marrano phenomenon.

HIST 374 Modern Jewish History I: the Road to Emancipation, 1650-1870 (3) Social, political, economic, and cultural change in the Jewish world since 1650. Emphasis on emancipation, assimilation, and new forms of Jewish identity in Western and Eastern European Jewry from the 17th to the 20th centuries.

HIST 375 Modern Jewish History II: World Jewry Since 1870 (3) Continuation of HIST 374.

HIST 376 History of Zionism and the State of Israel (3) Ideological and political factors leading to the establishment of a secular Jewish state in 1948. Zionist thought of Herzl, Ahad Ha-am, the socialist and religious Zionist, and the revisionists; diplomatic activities; Arab-Israel conflict, post-1948 Israeli society.

HIST 380 American Relations With China and Japan, 1740-1970 (3) American political, economic, and cultural relations with China and Japan from the American colonial era to the present. Diplomacy and power politics, Christian missions; immigration and exclusion; overseas education; art and literature; trade, investment, technology.

HIST 390 Middle East I (3) A survey of the political, cultral and institutional history covering the period up to the Tenth century.

HIST 391 Middle East II (3) A survey of the political, cultral and institutional history covering the period up from the tenth century to the beginning of the nineteenth century.

HIST 392 History of the Contemporary Middle East (3) The rise of sovereign nation-states, modernization, westernization and secularization in a traditional society; shifting political and economic power groupings within a regional and global context.

HIST 395 Honors Colloquium I (3) Enrollment limited to students admitted by the departmental honors committee. Discussion of reading and written work in weekly seminar meetings.

HIST 396 Honors Colloquium II (3) Continuation of HIST 395.

HIST 398 Honors Thesis (3)

HIST 400 Independent Study (1-6) Prerequisite: departmental approval of research project and consent of the department. Available to all students who wish to pursue a specific research topic.

HIST 401 The Scientific Revolution: From Copernicus to Newton (3) Major events in the history of physical science during the 16th and 17th centuries and their relation to philosophy, religion and society in Western Europe. The attack on ancient and medieval scientific theories, the transition from geocentric to heliocentric astronomy, discoveries of Kepler, Galileo and Newton, and the establishment of the "mechanical philosophy" that dominated early modern science.

HIST 402 The Development of Modern Physical Science: From Newton to Einstein (3) The history of physics in the 18th and 19th centuries, including some of its connections with mathematics, technology, chemistry and planetary science. Emphasis on internal technical developments in physical theory, with some discussion of experimental, philosophical and sociological aspects. This is the second part of a three-semester sequence (HIST 401, HIST 402, PHYS 490), each part may be taken independently of the others. For HIST 402 the prerequisites are MATH 110 and PHYS 112 OR 117, or equivalent competence in mathematics and physics.

HIST 403 20th Century Revolutions in the Physical Sciences (3) MATH 110 and PHYS 112 or 117, or equivalent competence in mathematics and physics. Analysis of major changes in knowledge of the physical world, including quantum theory/atomic structure, relativity/cosmology, and continental drift/plate tectonics; theories about the nature of scientific revolutions.

HIST 404 History of Modern Biology (3) The internal development of biology in the nineteenth and twentieth centuries, including evolution, cell theory, heredity and development, spontaneous generation, and mechanism - vitalism controversies. The philosophical aspects of the development of scientific knowledge and the interaction of biology with chemistry and physics.

HIST 407 History of Technology (3) The changing character of technology in modern history, beginning with the Middle Ages, but concentrating on the Industrial Revolution and its aftermath, the nature of technological knowledge, the sources of technological change, and the impact of technology on all aspects of our culture.

HIST 409 Topics in the History of Science and Technology (3) Selected topics in the history of science and technology. May be repeated to maximum of six semester hours.

HIST 410 Introduction to Archives I (3) Prerequisite: Consent of department. Corequisite HIST 411. History of the basic intellectual problems relating to archives and manuscript repositories; emphasis on problems of selection, access, preservation, inventorying and editing as well as the variety of institutions housing documents.

HIST 411 Introduction to Archives II (3) Prerequisite: Consent of department. Corequisite HIST 410. Practical experience through placement in cooperating archives or manuscript repositories in the Baltimore/Annapolis/Washington, D.C. areas. Assignments to specific projects based on intellectual interest of students.

HIST 412 Readings in Psycho-history (3) Application of psychological theories to the study of historical personalities and collective behavior, survey of relevant personality theorists, and an evaluation of recent contributions.

HIST 413 History of Medicine and Public Health (3) The history of medicine and public health from primitive times to the present, covering major medical theories, therapeutics, and techniques, the evolution of the medicine man or priest-physician into a professional medical practitioner, and the close relationship between medicine and society.

HIST 414 History of European Ideas I (3) Review of the basic western intellectual traditions as a heritage from the ancient world. Selected important currents of thought from the scientific revolution of the 16th and 17th centuries down to the end of the 18th century.

HIST 415 History of European Ideas II (3) A continuation of HIST 414 emphasizing 19th and 20th century thought.

HIST 416 Modern Jewish Intellectual History I (3) An introduction to the major ideas and ideologies of the Jewish people from the period of the expulsion from Spain in 1492 until the generation of Moses Mendelssohn and his contemporaries at the end of the eighteenth century. The course will emphasize the major intellectual developments within the Jewish community shaped by its encounter with major cultural developments such as the Renaissance, reformation and religious scepticism as well as by the constant threats to its collective identity and physical well-being throughout this entire period.

HIST 417 Modern Jewish Intellectual History II (3) An introduction to the major ideas and ideologies of the Jewish people from the end of the eighteenth century until the present. The course will consider the major intellectual responses to the problem of Jewish identity in the context of the effects of political and social emancipation, nationalism and socialism, secularism and cultural assimilation, as well as political anti-semitism and physical extermination upon the Jewish community.

HIST 418 Jews and Judaism: Selected Historical Topics (3) Repeatable to a maximum of 6 credit hours if topics differ.

HIST 419 Special Topics in History (3) May be repeated to a maximum of nine hours.

HIST 422 Byzantine Empire I (3) The Eastern Roman Empire from Constantine the Great to the crisis of the ninth century. The development of the late Roman state into the Medieval Christian Byzantine empire and the evolution of a distinctive Byzantine culture.

HIST 423 Byzantine Empire II (3) The Byzantine empire from the Macedonian renaissance to the conquest of Constantinople by the Turks in 1453. The Byzantine empire at its height, the crusades, Byzantium as a minor power, and its contributions to the Renaissance and the cultures of Russia and the Balkans.

HIST 424 History of Russia to 1801 (3)

HIST 425 History of Russia From 1801 - 1917 (3) A continuation of HIST 424.

HIST 426 Age of Industry: Britain 1760 to 1914 (3) An economic, social, political and cultural analysis of Britain in the age of her industrial supremacy. The nature of the first industrial revolution; the emergence of modern social classes; the cultural impact of industrialization; politics and society in the early and mid-nineteenth century; Victorianism and its critics, imperialism and politics, high and low culture; the rise of labor, social and political tensions 1910-1914.

HIST 427 Age of Decline: Britain 1914 to Present (3) British society since the First World War. The social, cultural, economic and political impact of the First World War, labor and politics in the 1920s and 1930s, the inter-war depression, appeasement and foreign policy; the social impact of the Second World War, the welfare state and nationalization of industry; the dissolution of Empire; the emergence of a consumer society; social criticism in 1950s, the economic and political problems of the 1960s and 1970s.

HIST 430 Tudor England (3) An examination of the political, religious and social forces in English life, 1485-1603, with special emphasis on Tudor government, the English reformation and the Elizabethan era.

HIST 431 Stuart England (3) An examination of the political, religious and social forces in English life, 1603-1714, with special emphasis on Puritanism and the English revolutions.

HIST 432 Britain in the 18Th Century (3) Developments in Great Britain from the revolution of 1688 to the end of the Napoleonic wars.

HIST 434 Constitutional History of Great Britain I (3) Constitutional development in England, with emphasis on the history of the royal prerogative, the growth of the common law, the development of Parliament, and the emergence of systematized government. First semester, to 1485.

HIST 435 Constitutional History of Great Britain II (3) Constitutional development in england, with emphasis on the history of the royal prerogative, the growth of the common law, the development of parliament, and the emergence of systematized government. Second semester, since 1485.

HIST 436 History of the British Empire (3) An analysis of the development of the British empire since the American revolution. Particular emphasis is given to the problem of responsible self-government, the evolution of the British empire into a commonwealth of nations and the problems of the dependent empire. Recommended prerequisites - HIST 112, 113, 141, OR 254.

HIST 437 Modern France from Napoleon to DeGaulle (3) The changing political and cultural values of French society in response to recurrent crises throughout the 19th and 20th centuries. Students should have had some previous survey of either western civilization or European history.

HIST 440 Germany in the Nineteenth Century, 1815-1914 (3) The development of modern Germany and the rise of national socialism.

HIST 441 Germany in the Twentieth Century, 1914-1945 (3) Germany's aims and policies during world War I, its condition and policies in the inter war period, the rise of national socialism, and Germany's part in World War II.

HIST 442 The Soviet Union (3) A history of Soviet Russia and the Soviet Union from 1917 to the presen

Stress on the relationship between Marxist theory and practice, and the development of peculiarly socialist institutions and practices.

HIST 443 Modern Balkan History (3) A political, socio-economic, and cultural history of Yugoslav, Bulgaria, Romania, Greece, and Albania from the breakdown of Ottoman domination to the present. Emphasis is on movements for national liberation during the nineteenth century and on approaches to modernization in the twentieth century.

HIST 444 Nineteenth Century European Diplomatic History (3) The development and execution of European diplomacy from the Congress of Vienna to the outbreak of World War I, concentrating on Central and Western Europe.

HIST 445 Twentieth Century European Diplomatic History (3) The development and execution of european diplomacy from the outbreak of World War I to the conclusion of World War II, concentrating on Central and Western Europe.

HIST 446 European Economic History to 1750 (3) Economic development of Europe from the manorial economy of medieval feudalism through the emergence of capitalist institutions and overseas empires to the advent of the industrial revolution.

HIST 447 European Economic History Since 1750 (3) The mainsprings of the Industrial Revolution first in 18th century England and then across the rest of Europe during the 19th and 20th centuries. Emphasis on the English, French, German, Austro-Hungarian and Russian experiences with private capitalism and public policy, including fascism and communism. Social consequences of industrial development such as urbanization and the rise of labor movements.

HIST 450 Economic History of the United States to 1865 (3) The development of the American economy from Columbus through the Civil War.

HIST 451 Economic History of the United States After 1865 (3) The development of the American economy from the Civil War to the present.

HIST 452 Diplomatic History of the United States to 1898 (3) American foreign relations from the beginning of the American Revolution in 1775 through the Spanish-American War of 1898, including both international developments and domestic influences that contributed to American expansion in world affairs, and analyses of significant individuals active in American diplomacy and foreign policy.

HIST 453 Diplomatic History of the United States Since 1898 (3) American foreign relations in the twentieth century during the age of Imperialism, World War I, the Great Depression, World War II, and the Cold War. A continuation of HIST 452.

HIST 454 Constitutional History of the United States: From Colonial Origins to 1860 (3) The interaction of government, law, and politics in the constitutional system. The nature and purpose of constitutions and constitutionalism; the relationship between the constitution and social forces and influences, the way in which constitutional principles, rules, ideas, and institutions affect events and are in turn affected by events. The origins of American politics and constitutionalism through the constitutional convention of 1787. Major constitutional problems such as the origins of judicial review, democratization of government, slavery in the territories and political system as a whole.

HIST 455 Constitutional History of the United States: Since 1860 (3) American public law and government, with emphasis on the interaction of government, law, and politics. Emphasis on the political-constitutional system as a whole, rather than simply the development of constitutional law by the Supreme Court. Major crises in American government and politics such as Civil War, reconstruction, the 1890's, the new deal era, the civil disorders of the 1960's.

HIST 456 History of Ideas in America to 1865 (3) The ideas, conflicts, myths, and realities that shaped American character and society from the first settlements to the Civil War.

HIST 457 History of Ideas in America Since 1865 (3) A continuation of HIST 456.

HIST 458 Selected Topics in Women's History (3) Selected topics on women in American society including such areas as women and the law, women and politics, the "feminine mystique" and the "new feminism." May be repeated to a maximum of six semester hours. Students previously receiving credit in HIST 408 may not enroll.

HIST 459 Society in America: Historical Topics (3) A consideration of selected aspects of American society from colonial times to the present. Special emphasis on regionalism, immigration, nativism, minorities, urbanization, and social responses to technological changes. May be repeated to a maximum of six credits if topics are different.

HIST 460 History of Labor in the United States (3) The American working class in terms of its composition, its myths and utopias, its social conditions, and its impact on American institutions.

HIST 461 Blacks in American Life: 1865 to Present (3) The role of the Black in America since slavery, with emphasis on twentieth century developments: the migration from farm to city, the growth of the civil rights movement, the race question as a national problem.

HIST 462 The Civil War (3) A detailed study of historical interpretations; the forces, situations and events that caused the war, the war and its impact.

HIST 463 History of the Old South (3) The golden age of the Chesapeake, the institution of slavery, the frontier south, the antebellum plantation society, the development of regional identity and the experiment in independence.

HIST 464 History of the New South (3) The experience of defeat, the restructuring of southern society, the impact of industrialization and the modern racial adjustment.

HIST 465 History of the American Frontier: the Trans-Allegheny West (3) Major historical interpretation of the significance to the period of the Trans-Allegheny West. Assesses the impact of the frontier experience on American history. Equal attention is given to political, economic, social and cultural problems associated with the development of the west. Indian culture, treatment of the Indians, and Indian-White relations are integrated into the course through readings and lectures.

HIST 466 History of the American Frontier: the Trans-Mississippi West (3) Exploration, settlement and development of the Trans-Mississippi West. Assesses the impact of the frontier experience on American history. Equal attention is given to political, economic, social and cultural problems associated with the development of the West. Indian culture, treatment of the indians, and indian-white relations are integrated into the course through readings and lectures.

HIST 467 History of Maryland (3) Political, social and economic history of Maryland from seventeenth century to the present.

HIST 470 Diplomatic History of Latin America (3) A survey of the political, economic and cultural relations of the Latin American nations with emphasis on their relations with the United States and the development of the inter-American system.

HIST 471 History of Brazil (3) The history of Brazil with emphasis on the national period.

HIST 472 History of the Argentine Republic (3) Concentration upon the recent history of Argentina with emphasis upon the social and economic development of a third world nation.

HIST 473 History of the Spanish Caribbean (3)

HIST 474 History of Mexico and Central America I (3) History of Mexico and Central America, beginning with the Pre-Spanish Indian cultures and continuing through European contact, conquest, and colonial dominance, down to the beginning of the Mexican War for Independence in 1810.

HIST 475 History of Mexico and Central America II (3) A continuation of HIST 474 with emphasis of the political development of the Mexican nation.

HIST 476 History of Canada (3) A history of Canada, with special emphasis on the nineteenth century and upon Canadian relations with Great Britain and the United States.

HIST 477 American Foreign Relations in the Age of Roosevelt (3) An intensive study of foreign relations from 1932 to 1945. Diplomacy in the Great Depression; rise and fall of American isolationism, "aid-short-of-war" in opposition to Axis aggression, FDR's conduct of foreign affairs during World War II, his guidance toward an expanded leadership role for the United States after the war, and beginnings of the Cold War with the Soviet Union.

HIST 480 History of Traditional China (3) China from earliest times to 1644 A.D. Emphasis on the development of traditional Chinese culture, society, and government.

HIST 481 A History of Modern China (3) Modern China from 1644 to the People's Republic of China. Emphasis on the coming of the west to China and the various stages of the Chinese reaction.

HIST 482 History of Japan to 1800 (3) Traditional Japanese civilization from the age of Shinto mythology and introduction of continental learning down to the rule of military families, the transition to a money economy, and the creation of a townsmen's culture. A survey of political, economic, religious, and cultural history.

HIST 483 History of Japan Since 1800 (3) Japan's renewed contact with the western world and emergence as a modern state, industrial society, and world power, 1800-1931, and Japan's road to war, occupation, and recovery, 1931 to the present.

HIST 485 History of Chinese Communism (3) An analysis of the various factors in modern Chinese history that led to the victory of the Chinese communist party in 1949 and of the subsequent course of events of the People's Republic of China, from ca. 1919 to the present.

HIST 487 History of Soviet Foreign Relations, 1917 to Present (3) A history of Soviet foreign relations both conventional diplomacy and the spread of proletarian international from the October Revolution to the present.

HIST 491 History of the Ottoman Empire (3) Survey of the Ottoman Turkish Empire from 1300 A.D. To its collapse during World War I. Emphasis on the empire's social and political institutions and its expansion into Europe, the Arab East and North Africa.

HIST 492 The Contemporary Middle East (3) This course covers the break-up of the Ottoman empire and the emergence of contemporary states of the area.

HIST 495 Twentieth Century Algeria (3) A brief survey of the history of Algeria and an indepth study of twentieth century events leading up to and including the War of Liberation and Algerian independence. Reading knowledge of French desirable.

HIST 496 A History of West Africa (3) West Africa from approximately 4500 B.C. To the colonial era. The development of agricultural and technological achievements, which made it possible for West African civilizations to emerge and endure and the development of the medieval and early modern state systems. The structure of West African societies, the people and their cultural history.

HIST 497 Economic History of West Africa (3) The economic history of West Africa from neolithic times to the end of the colonial era. Reading knowledge of French desirable.

HLTH — Health

HLTH 105 Science and Theory of Health (2) The scientific and philosophical bases for various theories of health, including health, wellness, individual control and limitations of health status, and holistic health.

HLTH 106 Drug Use and Abuse (3) An interdisciplinary analysis of contemporary drug issues and problems. The course will examine physiological, psychological, social, philosophical, historical, legal and health aspects of drug use and abuse. Special attention will be focused on those general motivations for drug use that attend life on the college campus.

HLTH 110 Orientation to Health Education (1) This course explores the field of health education in both the school and the community from the point of view of the health educator. Professional preparation and career opportunities are considered.

HLTH 130 Introduction to Health (3) Development of understanding and appreciation of the historic and significant purpose and place of each of the specialized health areas in general education. A study of the educational and personal requirements and opportunities of a career in each professional health area.

HLTH 140 Personal and Community Health (3) Meaning and significance of physical, mental and social health as related to the individual and to society, important phases of national health problems, constructive methods of promoting health of the individual and the community health problems young people encounter with special emphasis on health knowledge for future teachers

HLTH 150 First Aid and Emergency Medical Services (2) Lecture, demonstration and training in emergency care, including cardiopulmonary resuscitation, hemorrhage control, shock, poisons and bone injury treatment and childbirth American Red Cross and Heart Association of Maryland Certification awarded

HLTH 230 Introduction to Health Behavior (3) Psychological, social psychological, and sociological approaches to the following health areas development of health attitudes and behavior, patient-provider interaction and the organization of health care.

HLTH 260 Instructor's Course in First Aid (2) Prerequisite HLTH 150 or equivalent Advanced consideration of first aid techniques, orientation to methods, techniques and teaching aids, practical classroom instruction required. Red Cross instructor's certification awarded.

HLTH 270 Safety Education (3) Safety in the home, school and community Safety education programs in the public schools

HLTH 280 The Driver and His Characteristics (3) Prerequisite HLTH 270 The aim of this course is to treat the driver behavior problem in its relation to many of the psychophysical factors and forces in the traffic environment that impinge upon the man behind the wheel.

HLTH 285 Controlling Stress and Tension (3) Health problems related to stress and tension. Analysis of causitive psycho-social stressors and intervening physiological mechanisms Emphasis on prevention and control of stress through techniques such as bioteedback, meditation and neuromuscular relaxation.

HLTH 305 Driver Education and Traffic Safety I (3) Prerequisites HLTH 270, 280. This course is a study of the place of the automobile in modern life and deals with the fundamentals, principles, practices, and content of high school driver education and traffic safety Laboratory experience consists of observation and experience in teaching beginners to drive in dual control cars and simulators. Course includes eight weeks of practice teaching.

HLTH 310 Introduction to the School Health Program (2) Prerequisites HLTH 105 OR 140 This course deals with the aspects of school health health environment, health services, and health education The relationships of the school health program and the general education program are emphasized The roles of teachers, administrators, health specialists, and others in related fields are discussed.

HLTH 340 Curriculum, Instruction and Observation (3) Prerequisites HLTH 140, 270, 310, 420 A course designed to provide directed observation and discussion, coordinating these experiences with those from previous methods courses in the development of curricula for health and physical education. The course is planned to prepare for student teaching which follows in the same semester The observations will be made of health programs in junior and senior high schools This course must be taken during the semester in which the student is doing student teaching

HLTH 345 Driver Education and Traffic Safety II (3) Prerequisites HLTH 270, 280, 305, or their equivalents Comprehensive programming for driver education, teaching to meet driving emergencies and winter conditions, resources and agencies, the teacher and driver education, consumer education, insurance and liability

HLTH 365 Organization, Administration and Supervision of School Safety Education (3) Prerequisites HLTH 273, 280, 305, 345 or their equivalents Designed for teachers, school administrators, college instructors, and others responsible for directing or supervising safety programs in the schools Deals with the problems, policies, practices, and procedures involved in the organization, administration and the supervision of a comprehensive accident prevention and safety education program for the schools Considers integration factors of the school safety programs with the special emphasis on traffic programs.

HLTH 370 Behavioral Factors in Accident Causation and Prevention (3) Prerequisite HLTH 270 or permission of instructor The role of behavioral factors, as opposed to environmental or machine-agent influences in determining and reducing injurious mishaps Special emphasis on variables which affect protective motivation.

HLTH 371 Communicating Safety and Health (3) The communication and evaluation of safety and health information Emphasis on various types of communications and recipient factors which contribute to their success or failure.

HLTH 375 Problems in Driver and Traffic Safety Education (3) Prerequisites HLTH 270, 280, 305 345 or their equivalents An advanced course which gives consideration to the individual problems encountered in teaching driver and safety education The psychology of teaching and learning are emphasized Consideration is given to implications of emotion and attitude factors in driver and traffic education. The course includes an examination of existing courses of study, research, supervisory and evaluation practices

HLTH 390 Organization and Administration of School Health Programs (3) The three major aspects of the school health program are considered. Problems connected with health services, health instruction, and the health aspects of the school environment are discussed The responsibilities of school personnel are delineated with emphasis on the role of the administrator.

HLTH 420 Methods and Materials in Health Education (3) Prerequisites HLTH 105 OR 140, 310 or consent of instructor The purpose of this course is to present the interrelationships of curriculum planning methodology and the selection and use of teaching aids and materials Special problems associated with health teaching are discussed Students will become familiar with a variety of resources as well as planning for and presenting demonstration lessons.

HLTH 430 Health Education in the Workplace (3) A survey of the role of health education in work settings. Examination of occupational stress, the health effects of shift work, women's health in the workplace, health education approaches to informing workers and management, and health promotion programs in the workplace.

HLTH 450 Health of Children and Youth (3) A study of the health of 5 to 18 year olds Physical, mental social, and emotional health. Psychosexual development, diet, exercise, recreation, and the roles of parents and teachers.

HLTH 455 Physical Fitness of the Individual (3) A study of the major physical fitness problems confronting the adult in modern society Consideration is given to the scientific appraisal, development and maintenance of fitness at all age levels Such problems as obesity, weight reduction, chronic fatigue, posture, and special exercise programs are explored This course is open to persons outside the fields of physical education and health.

HLTH 456 Health of the Aging and Aged (3) Psychological, physiological and socio-economic aspects of aging, nutrition, sexuality, death, dying and bereavement, self-actualization and creativity, health needs and crises of the aged.

HLTH 460 Problems in School Health Education in Elementary and Secondary Schools (2-6) This is a workshop type course designed particularly for inservice teachers to acquaint them with the best methods of providing good health services, healthful environment and health instruction

HLTH 465 Safety Program Evaluation (3) Examination of the methods and techniques used to evaluate safety programs, with special reference to managerial decision making, needs assessment and hazard recognition, evaluation and control

HLTH 470 The Health Program in the Elementary School (3) Prerequisites HLTH 105 OR 140 310 This course designed for the elementary school classroom teacher analyzes biological and sociological factors which determine the health status and needs of the individual elementary school child The various aspects of the school program are evaluated in terms of their role in health education The total school health program is surveyed from the standpoint of organization and administration, and health appraisal Emphasis is placed upon modern methods and current materials in health instruction (The state department of education accepts this course for biological science credit)

HLTH 471 Women's Health (3) The women's health movement from the perspective of consumerism and feminism The physician-patient relationship in the gynecological and other medical settings The gynecological exam, gynecological problems, contraception, abortion, pregnancy breast and cervical cancer and surgical procedures. Psychological aspects of gynecological concerns.

HLTH 476 Death Education (3) Examination of the genesis and development of present day death attitudes and behavior by use of a multidisciplinary life cycle approach.

HLTH 477 Human Sexuality (3) The biological and developmental aspects of human sexuality the psychological and emotional aspects of sexual behavior, sexual identity the historical cultural social linguistic, legal and moral forces affecting sexual issues the importance of communication, disclosure and intimacy in interpersonal relationships, and research trends in the area of human sexuality

HLTH 480 Measurement in Health (3) Two lectures and two laboratory periods per week The application of the principles and techniques of educational measurement to the teaching of health and physical education, study of functions and techniques of measurements in the evaluation of student progress toward the objectives of health and physical education, and in the evaluation of the effectiveness of teaching

HLTH 489 Field Laboratory Projects and Workshop (1-6) A course designed to meet the needs of persons in the field with respect to workshop and research projects in special areas of knowledge not covered by regularly structured courses Note the maximum total number of credits that may be earned toward any degree in physical education, recreation, or health education under PHED, RECR, or HLTH 489 is six

HLTH 498 Special Topics in Health (3) Prerequisite: consent of instructor Topics of special interest in areas not covered by regularly scheduled courses Repeatable when the subject matter is different.

HONR — Honors

HONR 110 Freshman Honors Colloquium: Cultural and Historical (3) A colloquium on a variety of topics, each of which will include the study of a culture or cultures from a comparative or historical perspective Class discussion and active student participation will be stressed Open to general honors freshmen or sophomores and to other students by permission of the Director of General Honors

HONR 120 Freshman Honors Colloquium: Natural Sciences and Mathematics (3) A colloquium on a variety of topics in the natural sciences or mathematics Class discussion and active student participation will be stressed Open to general honors freshmen or sophomores and to other students by permission of the Director of General Honors

HONR 130 Freshman Honors Colloquium: Literature and the Arts (3) A colloquium on a variety of topics each of which deals with the aesthetic from an analytical and evaluative viewpoint Class discussion and active student participation will be stressed Open to general honors freshmen or sophomores and to other students by permission of the Director of General Honors

HONR 140 Freshman Honors Colloquium: Social and Behavioral Sciences (3) A course on a variety of topics in the social and behavioral sciences Class discussion and active student participation will be stressed Open to general honors freshmen or sophomores and to other students by permission of the Director of General Honors

HONR 150 Freshman Honors Colloquium: Interdisciplinary (3) A course on a variety of interdisciplinary topics of broad general interest Class discussion and active student participation will be stressed Open to general honors freshmen or sophomores and to other students by permission of the Director of General Honors

HONR 318 Honors Seminar: Cultural and Historical (1-3) A series of seminars, often interdisciplinary in character and sometimes team taught. The subjects will vary from semester to semester. The content will always be such that it includes the study of a culture or cultures from a comparative or historical perspective. The seminar may be repeated for credit with the permission of the Director of the General Honors program if the content of the course is substantially different. Open to general and departmental honors students and to others with the permission of the instructor and the Director of General Honors.

HONR 328 Honors Seminar: Natural Sciences and Mathematics (1-3) A series of seminars in the natural sciences and mathematics, often interdisciplinary in character and sometimes team taught. The subjects will vary from semester to semester. The seminar may be repeated for credit, with the permission of the Director of the General Honors program, if the content of the course is substantially different. Open to general and departmental honors students and to others with the permission of the instructor and the Director of General Honors.

HONR 338 Honors Seminar: Literature and the Arts (1-3) A series of seminars in literature and the arts, often interdisciplinary and sometimes team taught. The subjects will vary from semester to semester. The content will always be such that it includes a focus on the aesthetic from an analytic and evaluative viewpoint. The seminar may be repeated for credit, with the permission of the Director of the General Honors program, if the content of the course is substantially different. Open to general and departmental honors students and to others with the permission of the instructor and the Director of General Honors.

HONR 348 Honors Seminar: Social and Behavioral Sciences (1-3) A series of seminars in the social and behavioral sciences, often interdisciplinary and sometimes team taught. The subjects will vary from semester to semester. The seminar may be repeated for credit, with the permission of the Director of the General Honors program, if the content of the course is substantially different. Open to general and departmental honors students and to others with the permission of the instructor and the Director of General Honors.

HONR 358 Honors Seminar: Interdisciplinary (1-3) A series of seminars on broad interdisciplinary topics of general interest. The subjects will vary from semester to semester. The seminar may be repeated for credit, with the permission of the Director of the General Honors program, if the content of the course is substantially different. Open to general and departmental honors students and to others with the permission of the instructor and the Director of General Honors.

HONR 368 Honors Seminar: Development of Knowledge (1-3) A series of seminars, often interdisciplinary in character and sometimes team-taught. The creation, discovery, exploration, testing and evaluation of knowledge in one or more disciplines. The seminar may be repeated for credit, with the permission of the Director of the General Honors Program, if the content of the course is substantially different. Open to General and Departmental Honors students and to others with permission of the Director of General Honors.

HONR 370 Honors Thesis or Project (3-6) The preparation and execution, under the direction of an individual faculty member, of a written thesis or a project of some other kind, such as a piece of creative work or a performance. The thesis or project must be of honors quality and must be outside the student's major. Open only to students in the General Honors program.

HONR 378 Honors Seminar: Analysis of Human Problems (1-3) A series of seminars, often interdisciplinary in character and sometimes team-taught. The application of knowledge from one or more disciplines to the study of important human problems. The seminar may be repeated for credit, with the permission of the Director of the General Honors Program, if the content of the course is substantially different. Open to General Honors students and to others with permission of the Director of General Honors.

HONR 379 Honors Independent Study (1-6) Honors independent study involves reading or research, directed by individual faculty, especially in areas outside of student's major. HONR 379 or 360 but not both, may be used once to fulfill the general honors seminar requirement. Graded pass-fail. May be repeated to a maximum of twelve hours. Open only to general honors students.

HORT — Horticulture

HORT 111 Tree Fruit Production (3) Prerequisite: BOTN 101. Two lectures and one laboratory per week. A detailed study of the principles and practices in fruit production, harvesting and storage, with emphasis on the apple. One field trip required.

HORT 112 Tree Fruit Production (2) Two lectures per week. Prerequisite: HORT 111. A study of the principles and practices in fruit production, harvesting, and handling of deciduous tree fruit crops other than the apple.

HORT 132 Garden Management (2) Two lectures per week. Prerequisite: BOTN 101. The planting and care of ornamental plants on the home grounds and a study of commonly used species of annuals and herbaceous perennials.

HORT 142 Garden Management Laboratory (1) One two-hour laboratory per week. Prerequisite, or concurrent HORT 132. Demonstration and application of practices in the production and maintenance of garden plants.

HORT 160 Introduction to the Art of Landscaping (3) Three lectures per week. The theory and general principles of landscaping design with their application to public and private areas.

HORT 171 Elements of Forestry (3) Two lectures per week. Prerequisite: BOTN 101. A general survey of the field of forestry, including timber values, conservation, protection, silviculture, utilization, mensuration, engineering, recreation and lumbering. Principles and practices of woodland management. Four all-day Saturday field trips are required.

HORT 212 Small Fruit Production (3) Two lectures and one laboratory period a week. Prerequisite: BOTN 101. A study of the principles and practices involved in the production of small fruits including grapes, strawberries, raspberries, blackberries, and cranberries.

HORT 222 Vegetable Production (3) Two lectures and one laboratory period a week. Prerequisite: BOTN 101. A study of principles and practices of commercial vegetable production.

HORT 231 Greenhouse Management (3) Three lectures per week. Prerequisite: BOTN 101. A study of the construction and operation of structures for forcing horticultural crops and the principles underlying the regulation of growth under greenhouse conditions.

HORT 232 Flower Store Management (3) Two lectures and one laboratory period a week. Prerequisite: HORT 231. A study of the operation and management of a flower store. Laboratory period devoted to principles and practice of floral arrangements and decoration.

HORT 241 Greenhouse Crop Production Laboratory (1) One laboratory per week. Prerequisite: or concurrent HORT 231. Demonstration and application of practices in the commercial production of greenhouse crops.

HORT 242 Greenhouse Crop Production Laboratory (1) One laboratory per week. Prerequisite: HORT 231. Demonstration and application of practices in the commercial production of greenhouse crops.

HORT 260 Basic Landscape Composition (2) Two laboratory periods per week. The introduction of landscaping presentation technique, supplemented by problems in basic composition.

HORT 271 Plant Propagation (3) Three lectures per week. Prerequisite: BOTN 101. A study of the principles and practices in the propagation of plants.

HORT 274 Genetics of Cultivated Plants (3) Three lectures per week. Prerequisite: BOTN 101. Principles of plant genetics in relation to plant breeding. Some of the topics presented are meiosis, simple Mendelian genetics, gene interaction, linkage and crossing over, cytoplasmic and quantitative inheritance, mutations, and the role of DNA.

HORT 361 Principles of Landscape Design (3) One lecture and two laboratory periods per week. Prerequisite: HORT 160 and 260. A consideration of design criteria and procedure as applied to residential properties.

HORT 362 Advanced Landscape Design (3) One lecture and two laboratory periods per week. Prerequisite: HORT 361. Prerequisite or concurrent HORT 454. The design of public and private areas with the major emphasis on plant materials.

HORT 364 Landscape Construction (3) One lecture and two laboratory periods per week. Prerequisite: HORT 361. An introductory study and application of location methods, construction details, and construction techniques of the various landscape objects such as walks, walls, benches, roads.

HORT 398 Seminar (1) Oral presentation of the results of investigational work by reviewing recent scientific literature in the various phases of horticulture.

HORT 399 Special Problems (2) Credit arranged according to work done. For major students in horticulture or botany. Four credits maximum per student.

HORT 411 Technology of Fruits (3) Three lectures per week. Prerequisite: HORT 112 prerequisite HORT 112, prerequisite or concurrent BOTN 441. A critical analysis of research work and application of the principles of plant physiology, chemistry, and botany to practical problems in commercial production.

HORT 417 Tree and Small Fruit Management (1) Primarily designed for vocational agriculture teachers and extension agents. Special emphasis will be placed upon new and improved commercial methods of production of the leading tree and small fruit crops. Current problems and their solution will receive special attention.

HORT 422 Technology of Vegetables (3) Three lectures per week. Prerequisite: HORT 222, prerequisite or concurrent, BOTN 441. A critical analysis of research work and application of principles of plant physiology, chemistry, and botany to practical problems in commercial vegetable production.

HORT 427 Truck Crop Management (1) Primarily designed for teachers of vocational agriculture and extension agents. Special emphasis will be placed upon new and improved methods of production of the leading truck crops. Current problems and their solutions will receive special attention.

HORT 432 Fundamentals of Greenhouse Crop Production (3) Three lectures per week. Prerequisite: HORT 231. This course deals with a study of the commercial production and marketing of ornamental plant crops under greenhouse, plastic houses and out-of-door conditions.

HORT 433 Plants For Interior Decoration (2) Prerequisite: HORT 231 or permission of instructor. A study of the selection, production and use of plants for interior decoration and their installation and maintenance under interior conditions.

HORT 451 Technology of Ornamentals (3) Three lectures per week. Prerequisite: or concurrent BOTN 441. A study of the physiological processes of the plant as related to the growth, flowering and storage of ornamental plants.

HORT 453 Woody Plant Materials (3) Prerequisite: BOTN 212. A field and laboratory study of trees, shrubs, and vines used in ornamental plantings.

HORT 454 Woody Plant Materials (3) Prerequisite: BOTN 212. A field and laboratory study of trees, shrubs, and vines used in ornamental plantings.

HORT 456 Production and Maintenance of Woody Plants (3) Two lectures and one laboratory period a week. Prerequisite or corequisite: HORT 271, 454. A study of the production methods and operation of a commercial nursery and the planting and care of woody plants in the landscape.

HORT 457 Ornamental Horticulture (1) A course designed for teachers of agriculture and extension agents to place special emphasis on problems of the culture and use of ornamental plants.

HORT 471 Systematic Horticulture (3) Two lectures and one laboratory period a week. A study of the origin, taxonomic relationship and horticultural classification of fruits and vegetables.

HORT 472 Advanced Plant Propagation (2) Prerequisite: HORT 271. A study of the anatomy, morphology and physiology of the seed and plant as related to macro and micro forms of propagation. A

review of research in propagation.

HORT 474 Physiology of Maturation and Storage of Horticultural Crops (2) Two lectures a week. Prerequisite: BOTN 441. Factors related to maturation and application of scientific principles to handling and storage of horticultural crops.

HORT 489 Special Topics in Horticulture (1-3) Credit according to time scheduled and organization of course. A lecture and or laboratory series organized to study in depth a selected phase of horticulture not covered by existing courses.

HSAD — Housing and Design

HSAD 002 Portfolio Preparation Workshop (3) Non-credit, but equivalent to three credits for fee calculation purposes only. Prerequisite: Pre-design status. Guidance and assistance for students whose design portfolio did not pass the review required under selective admission to the majors of Interior Design or Advertising Design, or for students who wish to better prepare a portfolio prior to the review. Passing this course is not equivalent to a satisfactory completion of the portfolio review. Offered in Summer only on non-standard schedule.

HSAD 240 Design and Furnishings in the Home (3) Three lectures a week. Prerequisites: APDS 101 or 104. Designed to meet need for basic information and competency in choice and arrangement of home furnishings. For nonmajors only.

HSAD 246 Materials of Interior Design (3) Prerequisite: consent of instructor. Investigation of materials and construction characteristics of interior architecture and furnishings. Emphasis on use, limitations, sources. Directions in current research.

HSAD 251 Housing Issues and Prospects (3) Social and economic issues associated with the production, consumption and regulation of housing. Perceptions of the housing unit, factors affecting the cost and financing of housing, and the role of federal and local government in the distribution of the housing resource.

HSAD 340 Period Homes and Their Furnishings (3) Prerequisites: APDS 101, HSAD 246, or equivalent. A study of authentic interiors and furnishings. Exploration of style influences apparent in contemporarily produced items.

HSAD 341 Contemporary Developments in Architecture, Interiors, Furnishings (3) Prerequisite: HSAD 246 and consent of instructor. Style origins and development of twentieth century architecture as living space. Architects, designers, trends, philosophy of relationship of interior space to furnishings.

HSAD 342 Space Development (3) One lecture, 2 two-hour studios. Prerequisites: APDS 101, 102, 103, EDIT 160, or equivalent. A study of blue prints and house construction as they relate to the interior designer. Development and drafting of original plans emphasizing the functional spatial relationship of furnishings to interiors.

HSAD 343 Interior Design I (3) One lecture-discussion, two studio periods. Prerequisites: APDS 101, EDIT 210, or equivalent. Complete presentation of rooms, isometric and perspective projections rendered in color, purchase and work orders. Emphasis on individual and family living space.

HSAD 344 Interior Design II (3) One lecture-discussion, two studio periods. Prerequisite: HSAD 343. Continuation of HSAD 343 with emphasis on commercial and contract assignments.

HSAD 345 Professional Aspects of Interior Design (3) One lecture plus work experience. Professional orientation, ethics, and practices.

HSAD 362 Ideas in Design (3) Prerequisite: completion of distributive studies areas A and C. Key concepts in design, including style, type, rule, system, meaning and model. Examination of historical and contemporary periods.

HSAD 380 Professional Seminar (2) Two lecture discussion periods. Prerequisite: junior standing and consent of instructor. Exploration of professional and career opportunities, ethics, practices, professional organizations. Portfolio evaluation.

HSAD 440 Interior Design III (4) Eight hours studio periods. Prerequisite: HSAD 344. Preparation of complete presentation: work specifications, floor plans, purchase orders, renderings, etc. Portfolio preparation.

HSAD 441 Interior Design IV (4) Eight hours studio periods. Prerequisite: HSAD 440. Preparation of complete presentation: work specifications, floor plans, purchase orders, renderings, etc. Portfolio preparation.

HSAD 442 Barrier-free Interiors I (3) Prerequisite: APDS 101A or equivalent and consent of instructor. An introduction to determinants of design decisions in relation to the handicapped, aging and disabled: physical limitations and design support systems.

HSAD 443 Barrier-free Interiors II (3) Prerequisites: HSAD 343, HSAD 442. Three studio periods. Experience in solving problems related to interior space, both individual and congregate, and its use by the handicapped, aging and disabled.

HSAD 451 Gaming Simulation in Design I (3) Prerequisites: Two upper-division level courses in HSAD, FMCD, ARCH, URBS, GVPT or permission of instructor. Simulation games as a means to model social interaction. Applications in the fields of urban, architectural, interior and graphic design; planning, housing, and community development. Mathematical gaming theory as it relates to simulation games.

HSAD 452 Gaming Simulation in Design II (3) Prerequisite: HSAD 451. The design and testing of student-developed simulation games in the fields of urban, architectural, interior and graphic design; planning, housing, and community development.

HSAD 458 Readings in Housing (3) Prerequisite: SOCY 100 and consent of instructor. Readings in depth under the guidance of a faculty member on one or more facets of housing, in support of individual interests in urban renewal, public housing, etc. Repeatable to a maximum of six credits.

HSAD 460 Housing Costs and Financing (3) Prerequisites: MATH 110 and ECON 205 or equivalent. Effects of housing costs and financing on the ability of households to obtain satisfactory housing. Influence of the public and private groups on the cost of housing and availability of financing. Basic quantitative techniques of housing cost analysis.

HSAD 462 Seminar on Ideas in Design (3) Pre- or corequisite: HSAD 362 or consent of instructor. Detailed examination and discussion of concepts presented in HSAD 362.

HSAD 488 Selected Topics in Housing and Interior Design (1-6) Offered on demand. May be repeated to a maximum of six hours.

HSAD 499 Individual Study in Housing And/or Interior Design (3-4) Guidance for the advanced student capable of independent subject matter investigation or creative work. Problem chosen with consent of instructor.

IADM — Institution Administration

IADM 200 Introduction to Food Service (2) Introduction to the historical development, future trends, and careers in the food service industry, e.g. franchises, multi-unit corporations, hospitals, educational institutions, and vending.

IADM 300 Foodservice Organization and Management (3) Introduction to the foodservices, principles of organization, management. Financial control, and technical operations. Records, reports and organization charts included.

IADM 340 Foodservice Systems Management in the Community (4) Two lectures and one six hour laboratory per week. Prerequisite: FOOD 250 and IADM 300. Pre- or corequisite: NUTR 300. The evaluation of community feeding problems caused by the complexity of such factors as age, economic situation, ethnicity, culture and religion.

IADM 350 Foodservice Operations I (4) Two lectures and one five hour laboratory. Prerequisite: FOOD 250; Pre- or corequisite: IADM 300 and MICB 200. Introduction to the responsibilities of first level food service supervisors in quantity foodservice. Includes planning, preparation, service and safety of acceptable, nutritionally adequate meals at designated budgetary levels. Laboratory experience in quantity food production and service.

IADM 355 Foodservice Operations II (4) Two lectures and one five-hour laboratory per week. Prerequisite: IADM 350. Study of topics such as market analysis, menu pricing and merchandizing, food and labor cost accounting, recipe development for delayed foodservice systems and problem solving techniques. Laboratory experience in objective testing of quantity food products, recipe development and solving food service problems.

IADM 410 School Foodservice (3) Two lectures and one morning a week for field experience in a school foodservice. Prerequisite: FOOD 200, OR 240 and 250, and NUTR 300, or consent of instructor. Study of organization and management, menu planning, food purchasing, preparation, service, and cost control in a school lunch program.

IADM 440 Foodservice Personnel Administration (2) Personnel selection, training, scheduling, job evaluation, labor regulations and communications.

IADM 450 Foodservice Equipment and Planning (3) Two lectures and one three-hour laboratory per week. Prerequisite: IADM 350. Equipment selection, maintenance and layout. Relation of the physical facility to production and service.

IADM 455 Manpower Planning in the Foodservice Industry (3) Prerequisites: IADM 350, and BMGT 362 or ECON 370. The foodservice labor market with emphasis on human resource planning and development, workforce productivity, and equal employment opportunities for minorities and the handicapped. Future needs and implications indicated by these and other factors.

IADM 480 Practicum in Institution Administration (3) Prerequisites: IADM 350 and consent of instructor. Inservice training and practical experience totaling at least 120 hours in an approved foodservice operation under direct supervision of practicum advisor.

IADM 490 Special Problems in Foodservice (2-3) Prerequisites: senior standing, five hours in IADM courses and consent of instructor. Individual selected problems in the area of foodservice.

IADM 498 Special Topics (1-3) Prerequisite: consent of instructor. Selected current aspects of institution administration. Repeatable to a maximum of six credits if the subject matter is substantially different.

ITAL — Italian

ITAL 101 Elementary Italian I (4) Introduction to basic grammar and vocabulary, written and oral work. Credit will not be given for both ITAL 101 and ITAL 121.

ITAL 102 Elementary Italian II (4) Prerequisite: ITAL 101 Completion of study of basic grammar, written and oral work, with an increasing emphasis on spoken Italian.

ITAL 121 Accelerated Italian I (3) An intensive beginning course in Italian language skills: guided practice in reading and writing, understanding the spoken language and conversation, to enable the student to move more quickly to advanced courses. Restricted to students already having a good background in at least one other foreign language (successful completion of level 4 in high school, OR 104 or equivalent at the university level, or through linguistic competence acquired by residence abroad, or by demonstration of equivalent proficiency). With 122, may be used to satisfy language requirements.

ITAL 122 Accelerated Italian II (3) Prerequisite: ITAL 121. An intensive beginning course in Italian language skills: guided practice in reading and writing, understanding the spoken language and conversation, to enable the student to move more quickly to advanced courses. May be used to satisfy language requirements. Credit will not be given for both ITAL 203 and ITAL 122.

ITAL 203 Intermediate Italian (4) Prerequisite: ITAL 102. Review of Italian grammar, extensive reading, discussion, and composition. Completion of this course fulfills the arts and humanities language requirement. Credit will not be given for both ITAL 203 and ITAL 122.

ITAL 204 Review Grammar and Composition (3) Perequisite: ITAL 203 or 122, or course chairman's consent. An intensive review of major aspects of contemporary grammatical usage, training in comprehension, an introduction to guided composition.

ITAL 211 Intermediate Conversation (3) Prerequisite: ITAL 203 or consent of course chairman. Practice in

spoken Italian with emphasis on contemporary Italian culture. Not open to native speakers.

ITAL 251 Introduction to Italian Literature (3) Prerequisite: ITAL 203. Required of all students who continue in advanced courses of the department with the exception of superior students who are permitted to bypass an introduction to Italian literature. Conducted in Italian. Reading of literary texts, discussion and brief essays.

ITAL 279 Readings in Italian Literature in Translation (3) Topic to be determined each semester. All readings, discussions and examinations in English. No prerequisites. Repeatable for a maximum of 6 credits.

ITAL 301 Advanced Conversation and Composition (3) Prerequisite: ITAL 204 or consent of instructor. Written and oral work, grammar review and practice, designed to better the students' abilities to write and speak fluently and correctly.

ITAL 351 Italian Literature From Dante to the Renaissance (3) Prerequisites: ITAL 204 or 251 or permission of instructor. Basic survey of history of Italian literature.

ITAL 352 Italian Literature From the Renaissance to the Present (3) Prerequisites: ITAL 204 or 251 or permission of instructor. Basic survey of history of Italian literature.

ITAL 370 Italian Civilization (3) Political, social, intellectual, literary and artistic forces shaping contemporary Italy, from the late Middle Ages to the present. Taught in English.

ITAL 376 The Italian Opera Libretto (3) A history and analysis of Italian opera librettos from Monteverdi through Mozart to Verdi and Puccini. In English.

ITAL 399 Directed Study in Italian (1-3) Prerequisite: permission of department. Intended for undergraduates who wish to work on an individual basis with a professor of their choice. Repeatable for a maximum of three credits.

ITAL 410 The Italian Renaissance (3) A study of major trends of thought in Renaissance literature, philosophy, art, and science.

ITAL 411 Dante (3) Dante's thought as expressed in his major writings: "The Vita Nuova," "De Monarchia" and "The Divine Comedy." In English.

ITAL 475 Italian Cinema: A Cultural Approach (3) The culture of Italy through the medium of film from the silent days up to the present. In English.

ITAL 498 Special Topics in Italian Literature (3) Repeatable for a maximum of six credits.

ITAL 499 Special Topics in Italian Studies (3) An aspect of Italian studies, the specific topic to be announced each time the course is offered. Repeatable for a maximum of 6 credits.

IVSP — Individual Studies Program

IVSP 318 Individual Studies (1-15) Prior permission of the administrative dean for undergraduate studies required. This course may be used by students in the Individual Studies Program to establish credit in approved informal educational experiences such as independent studies, special problems, or work-study experience.

IVSP 319 Tutorial Report (1) A written analysis of progress toward completion of degree requirements. Limited to students in the Individual Studies Program.

IVSP 320 Bachelor's Report (3) Required of all students in the Individual Studies Program whose program includes 40% or more of informal educational experience (independent study, special problems, work internship, etc.) And is strongly recommended for all students in the program. This paper is to be completed in the student's final semester and approved by the tutor and committee prior to certification for the degree.

JAPN — Japanese

JAPN 101 Elementary Japanese I (6) Introduction to basic patterns of contemporary spoken Japanese and to the two phonetic syllabaries (Katakana and Hiragana).

JAPN 102 Elementary Japanese II (6) Prerequisite: JAPN 101 or equivalent. Continued introduction to the basic spoken and written patterns of contemporary Japanese.

JAPN 201 Intermediate Spoken Japanese I (3) Prerequisite: JAPN 102 or equivalent. Further study of grammar with emphasis on the spoken language.

JAPN 202 Intermediate Written Japanese I (3) Prerequisite: JAPN 103 or equivalent. Continued study of the written Japanese language through reading and composition.

JAPN 203 Intermediate Spoken Japanese II (3) Prerequisite: JAPN 201 or equivalent. Continuation of JAPN 201.

JAPN 204 Intermediate Written Japanese II (3) Prerequisite: JAPN 202 or equivalent. A continuation of JAPN 202.

JAPN 217 Buddhism and Japanese Literature in Translation (3) A study of the religious and philosophical traditions central to the Japanese imaginative life and literature from ancient to modern times.

JAPN 301 Advanced Japanese I (3) Prerequisite: JAPN 202 or equivalent. Readings in modern literary texts and other selected materials, and advanced conversation and oral comprehension.

JAPN 302 Advanced Japanese II (3) Prerequisite: JAPN 301 or equivalent. Continued readings in varied modern texts and advanced conversation and oral comprehension.

JAPN 303 Business Japanese I (3) Prerequisite: JAPN 203 and 204 or equivalent. Conversation, reading, and writing applicable to Japanese business transactions, social meetings, and meetings with government organizations, with background material in English on professional business practices and social customs associated with business.

JAPN 304 Business Japanese II (3) Prerequisite: JAPN 303 or eqivalent. Continuation of JAPN 303.

JAPN 401 Readings in Modern Japanese I (3) Prerequisite: JAPN 302 or equivalent. Development of translation techniques, vocabulary, grammar, and reading speed. Readings in history, social sciences, modern literature, and modern newspaper and periodical literature.

JAPN 402 Readings in Modern Japanese II (3) Prerequisite: JAPN 401 or equivalent. Continuation of more advanced readings.

JAPN 403 Readings in Classical Japanese (3) Prerequisite: JAPN 302 or equivalent. Classical Japanese grammar and the varied styles of classical Japanese. Readings in classical texts drawn from the Heian, Kamakura, Muromachi, and Edo periods.

JAPN 414 Masterpieces of Classical Japanese Literature in Translation (3) Major classics, with focus on philosophical, historical and cultural backgrounds.

JAPN 415 Modern Japanese Fiction in Translation (3) Major themes and literary developments in fiction from the late 19th century to the present. Emphasis on the works of Kawabata, Tanizaki, Mishima, and Abe.

JAPN 418 Japanese Literature in Translation (3) Representative works of Japanese literature in translation. May be repeated for a total of nine credits when content differs.

JAPN 421 History of the Japanese Language (3) Investigation of the origin of the Japanese language, its relationship with other languages, and its development. In English.

JAPN 422 Introductory Japanese Linguistics (3) An investigation of Japanese sound patterns and syntax through a comparison with English.

JAPN 499 Directed Study in Japanese (1-3) Prerequisite: permission of instructor. Repeatable to a maximum of six credits.

JOUR — Journalism

JOUR 001 Professional Orientation (1) Pre- or corequisite: JOUR 201 or equivalent. Provisional or regular majors only. A survey of journalism professions, emphasizing appropriate academic and career development strategies. Satisfactory/Fail grading option only.

JOUR 002 Professional Practicum (1) Prerequisite: JOUR 396. Additional professional communication practical experience in newspapers, news broadcasting, public relations, advertising, magazines, science communication and photojournalism. Satisfactory/Fail grading option only.

JOUR 100 Introduction to Mass Communication (3) Survey of the functions and effects of the mass media in the United States. A consumer's introduction to newspapers, television, radio, film, sound recording, books, magazines, and new media technology. Introduction to public relations, advertising, and news analysis.

JOUR 201 Writing For Mass Media (3) Prerequisite: 30 words per minute typing ability; provisional admission to journalism major. Introduction to news, feature and publicity writing for the printed and electronic media, development of news concepts; laboratory in news gathering tools and writing skills.

JOUR 202 Editing For the Mass Media (3) Prerequisite: JOUR 201. Basic editing skills applicable to all mass media: copy editing, graphic principles and processes, new media technology.

JOUR 320 News Reporting (3) Prerequisite: JOUR 202. Principles and practices of news reporting with special emphasis on news gathering for all the media, covering news beats and other news sources, including researching a news story for accuracy, comprehensiveness and interpretation.

JOUR 321 Reporting of Public Affairs (3) Advanced training in writing news for publication in specialized areas, particularly city, county, and federal news. Students meet in seminar with news sources and leading news reporters and work in Washington, D.C., Annapolis, and Baltimore in covering news in depth for publication. Prerequisites: JOUR 320 and permission of the instructor.

JOUR 322 Community News Reporting (3) Prerequisite: JOUR 320. Experience in news reporting and writing news events and human interest stories for community newspapers.

JOUR 323 Newspaper Editing (3) Prerequisite: JOUR 202. Principles and practices of editing for publication. Copy improvement, headline writing, news photos and cutlines, wire services, copy control and scheduling, page design and layout. Introduction to computerized editing with video display terminals.

JOUR 324 Newspaper Production (3) Prerequisite: JOUR 320 and 323. Theory and practice of newspaper production. Reporting, research, writing, photography, and editing for a laboratory newspaper. Design and assembly of newspaper pages.

JOUR 325 Newspaper Supervision (3) Prerequisites: JOUR 320, 323, and instructor's permission. Supervision of laboratory newspaper staff.

JOUR 326 News Commentary and Critical Writing (3) Prerequisite: JOUR 320. Journalistic interpretation and analysis; editorial and critical writing.

JOUR 328 Specialized News Reporting (3) Prerequisite: JOUR 320. Advanced training and practice in writing and reporting news of one specialized field of interest. Repeatable to a maximum of six credits provided the topic differs.

JOUR 330 Public Relations Theory (3) Prerequisite: JOUR 201. The historical development and contemporary status of public relations in business, government, associations and other organizations. Application of communication theory and social science methods to the research, planning, communication and evaluation aspects of the public relations process.

JOUR 331 Public Relations Techniques (3) Prerequisites: JOUR 202 and 330. The techniques of public relations including news releases, publications and printed materials, audio-visual techniques, speeches and special events. Application of these techniques in laboratory and field projects.

JOUR 333 Organizational Communication in Public Relations (3) Prerequisites: JOUR 202 and 330. Theory and techniques for planning and producing organizational publications and internal communication programs. Theories of organizational communication, principles of layout and design, non-print communication media, and methods of pretesting and evaluating communications programs.

JOUR 340 Advertising Communication (3) Prerequisite: JOUR 201. Advertising as a mass communication profession and its role in the public information system of the United States. Application of communication theory and research methods to the research, planning, communication, and evaluation aspects of advertising.

JOUR 341 Advertising Techniques (3) Prerequisite: JOUR 202 and 340. Writing and production of print and broadcast advertisements; application of these techniques in laboratory and field projects.

JOUR 350 Photojournalism (3) Prerequisite: JOUR 201. Fundamentals of camera operation, composition, developing and printing black and white still photographs for publication; history of photojournalism. Not open to students with credit in JOUR 372.

JOUR 351 Advanced Photojournalism (3) Prerequisite: JOUR 350. Analysis of the role of photography in mass communication, with emphasis on the photographic essay, and use of the 35 mm camera. Students provide 35 mm equipment and supplies.

JOUR 352 Special Topics in Photojournalism (3) Prerequisites: JOUR 351 and consent of instructor. An analysis of the theory and application of advanced photographic processes to the communication of ideas, including direct audience communication, realistic and nonrealistic visual materials and media.

JOUR 360 Broadcast News I (3) Prerequisite: JOUR 202. Writing for the broadcast media and the production of news stories.

JOUR 361 Broadcast News II (3) Prerequisite: JOUR 360. Writing and editing for the broadcast media. Interpretive and documentary news stories.

JOUR 365 Theory of Broadcast Journalism (3) Descriptive and critical analysis of broadcast news practices; evaluation of news judgments; decision-making and organizational aspects of the broadcast news industry.

JOUR 371 Magazine Article and Feature Writing (3) Prerequisite: JOUR 320. Types of feature articles, particularly for the magazine market; analysis of the magazine medium and specialized audiences; practice in researching and writing the feature article; analysis of free-lance markets.

JOUR 372 Magazine Photography and Illustration (3) Prerequisite: JOUR 201. Camera selection and operation, film selection and processing; print making; scaling and sizing of photographs; picture layout. Students must provide 35 mm camera plus supplies. Not open to students with credit in JOUR 350.

JOUR 373 Graphics (3) Prerequisite: JOUR 202. Intensive analysis of the components of publication content and design. Type and typography, printing processes, illustration and production with emphasis on contemporary technology.

JOUR 374 Magazine Production (3) Prerequisites: JOUR 371 and 373. Publication of a laboratory magazine.

JOUR 380 Journalism For Science and Technology (3) Prerequisite: JOUR 201. Writing and editing scientific and technical material for both the general audience and the specialist.

JOUR 396 Supervised Internship (3) Prerequisite: JOUR 202, first course of journalism sequence related to the internship and consent of instructor. Internship experience with communication professionals in newspapers, news broadcasting, public relations, advertising, magazines, photojournalism, and science communication. Relation of academic training to professional experience.

JOUR 397 Professional Seminar (3) Prerequisite: JOUR 201 and consent of instructor. Projects and discussions relating professional work experience to study of journalism. Limited to students who participated in an advanced summer internship after the junior year.

JOUR 398 Independent Study (1-3) Individual projects in journalism. May be repeated to a maximum of three credits.

JOUR 400 Law of Mass Communication (3) Legal rights and constraints of mass media; libel, privacy, copyright, monopoly, and contempt, and other aspects of the law applied to mass communication. Previous study of the law not required.

JOUR 410 History of Mass Communication (3) Development of newspapers, magazines, radio, television and motion pictures as media of mass communication. Analysis of the influences of the media on the historical development of America.

JOUR 420 Government and Mass Communication (3) Relationship between news media and government, media coverage of government and politics, governmental and political information and persuasion techniques.

JOUR 430 Comparative Mass Communication Systems (3) Comparative analysis of the role of the press in different societies.

JOUR 440 Public Opinion and Mass Communication (3) Measurement of public opinion and media habits, role of the mass media in the formation of public opinion.

JOUR 450 Mass Media in Society (3) Ethical, moral, political, economic, and social consideration of mass communication.

JOUR 459 Special Topics in Mass Communication (3) Issues of special concern and current interest. Open to all students. Repeatable to a maximum of six credits provided the topic differs.

JOUR 460 Women in the Media (3) Participation and portrayal of women in the mass media from colonial to contemporary times.

JOUR 470 Newspaper Management (3) Organization, operation, and administration of the departments of a newspaper: advertising, business-finance, circulation, news-editorial, personnel, production, and promotion.

JOUR 480 Mass Communication Research (3) Prerequisite: MATH 110 or equivalent; students are encouraged to have completed the theory and technique courses in their major sequence. Communication research methods used in measuring public opinion and evaluating public relations, advertising, and mass media programs and materials.

JOUR 481 Advanced Science Writing (3) Prerequisite: JOUR 320 or 380. Intensive application of modern feature writing technique, both explanatory and dramatic, to the science writing field.

JOUR 483 Public Relations Campaigns (3) Prerequisite: JOUR 331. Planning and execution of public relations campaigns for specific organizations; integration of public relations theories and techniques into a complete campaign.

JOUR 484 Advertising Campaigns (3) Prerequisite: JOUR 341. Planning and executing advertising campaigns in actual agency situations. Integration of advertising theories and techniques into a complete campaign.

JOUR 486 Advanced Television Journalism (3) Prerequisite: JOUR 361 or permission of instructor. A skills course in which students assume major responsibility for the production of a once weekly TV news and public affairs program. Students will work on extended TV reporting assignments such as mini-series and news documentaries. Note: In addition to classroom time, students are required to devote time out of class in reporting and editing.

JOUR 487 Literary Journalism (3) Prerequisite: JOUR 371. Practice in the use of literary techniques and especially of dramatic structure in modern newspaper series, magazine pieces and books. Analysis, researching and writing of nonfiction stories, usually with a focus on a specialized area chosen by the student.

JOUR 490 Advising Student Publications (3) Journalistic writing and editing in student newspapers, yearbooks, and magazines; libel and policy curriculum and teaching procedures; role of student publications.

JOUR 491 Policy, Censorship, and Legal Problems of Student Publications (3) Censorship problems and court cases; legal rights of the student press; formulation of policy and legal guidelines.

JOUR 492 Typography and Layout For Student Publications (3) Type design, type families, graphics, art, photography, and editorial and advertisement layout of school newspapers, year books, and magazines.

JOUR 493 Advanced Techniques For Student Publication Advisors (3) Interpretative and investigative reporting, interviewing and scientific survey methods, curriculum and courses for high school and community colleges, textbooks, teaching units, and resource aids.

LATN — Latin

LATN 101 Elementary Latin (3) A student who has had two units of Latin in high school may register for LATN 101 for purposes of review but ordinarily not for credit.

LATN 102 Elementary Latin (3) A student who has had two units of Latin in high school may register for LATN 102 for credit with departmental permission.

LATN 120 Intensive Latin (4) Prerequisite: permission of instructor. Not open for credit to students with credit for LATN 102. Elements of Latin grammar and vocabulary, elementary reading. The first year's study of Latin compressed into a single semester.

LATN 203 Intermediate Latin I (3) Prerequisite: LATN 101, 102 or equivalent.

LATN 204 Intermediate Latin II (3) Prerequisite: LATN 203 or equivalent.

LATN 220 Intermediate Intensive Latin (6) Prerequisites: LATN 102 or LATN 120, or equivalent. Not open to students with credit for LATN 204. Review of Latin grammar, reading in prose and poetry from selected authors.

LATN 305 Vergil's Aeneid (3) Prerequisite: LATN 204 or equivalent.

LATN 319 Special Topics in Latin Literature (3) Repeatable for a maximum of six credits if the subject matter is different.

LATN 351 Horace (3) Prerequisite: LATN 305 or equivalent.

LATN 352 Livy (3) Prerequisite: LATN 351 or equivalent.

LATN 361 Pliny's Letters (3) Prerequisite: LATN 352 or equivalent.

LATN 400 level course prerequisite: LATN 361

LATN 401 Catullus and the Roman Elegiac Poets (3)

LATN 402 Tacitus (3)

LATN 403 Roman Satire (3)

LATN 404 Roman Comedy (3)

LATN 405 Lucretius (3)

LATN 411 Advanced Latin Grammar (3) Prerequisite: three years of college Latin or equivalent. An intensive study of the morphology and syntax of the Latin language supplemented by rapid reading.

LATN 488 Independent Study in Latin Language and Literature (1-3) Permission of departmental chairman and instructor required. Repeatable to a maximum of 6 credits.

LATN 499 Latin Readings (3) Prerequisite: consent of instructor. The reading of one or more selected Latin authors from antiquity through the Renaissance. Reports. May be repeated with different content.

LBSC — Library Science

LBSC 322 Information in Society (3) An introduction to information and information technologies as dynamic forces with social consequences.

LBSC 331 Introduction to Educational Media Services (3) An overview of the library profession. Development of public, academic, special and school services. History of books and libraries. The library as a social institution. The impact of communication media on society. Philosophy of librarianship. Professional standards, organizations and publications.

LBSC 381 Basic Reference and Information Sources (3) An introductory course in the nature of reference/information service and the sources, tools, and technology essential to the reference process. Selection, evaluation and utilization of all types of reference tools for library media centers.

LBSC 382 Organization of Library Collections (3) Introduction to the principles and practices of media and information retrieval system organization and construction, including classification schemes, cataloging codes, subject heading lists, index languages, and file control.

LBSC 383 Library Materials For Children and Youth (3) Study of literature and media for children and youth, including fiction and information materials: books, periodicals, video, filmstrips, films, microforms, records, pictures, pamphlets. Introduction to reading, viewing, and listening guidance techniques.

LBSC 384 Media Center Administration and Services (3) The management and operation of instructional media centers, including staffing, materials and equipment management, dissemination and control of information, program planning and evaluation, and facilities design.

LBSC 488 Recent Trends and Issues in Library and Information Services (1-3) Discussions of recent trends and issues in library and information services, designed for practicing professionals.

LBSC 499 Workshops, Clinics, and Institutes (1-9) Workshops, clinics, and institutes developed around specific topics or problems primarily for practicing librarians. Repeatable to a maximum of nine credit hours.

LING — Linguistics

LING 100 Study of Languages (3) The nature of languages and approaches to the study of languages. Discussion of sounds and forms, clarification of terminology relevant to the learning of a second language. Survey of language types and writing systems. Cannot be used to satisfy division foreign language requirement. Credit will not be given for both LING 100 and LING 200.

LING 200 Introductory Linguistics (3) Ways of studying human language; basic concepts of modern linguistic analysis (sound systems, word formation, syntax, meaning). The nature of human language: the social aspects of language, language change, dialects, writing systems, language universals, etc. Credit will not be given for both LING 100 and LING 200. Not open for credit to students who have credit in ENGL 280, ANTH 371, or HESP 120.

LING 240 Language and Mind (3) The study of language as a cognitive phenomenon. Ways of representing people's knowledge of their native language, ways in which that knowledge is attained naturally by children, and how it is used in speaking and listening. Relevant philosophical literature. Relationship to study of other cognitive abilities: reasoning, perception, sensory-motor development.

LING 300 Concepts of Grammar (3) Introduction to the basic units of language description. Nature of and reasons for constituent structure and syntactic categories. Fundamental tools for language description needed for teaching and learning foreign languages.

LING 311 Syntax I (3) Prerequisite: LING 240. Basic concepts, analytical techniques of generative syntax, relation to empirical limits imposed by viewing grammars as representations of a component of human mind. Aspects of current theories.

LING 312 Syntax II (3) Prerequisite: LING 311. Continuation of LING 311. Development of theories of syntax. Criteria for revising theories. Methods and strategies of "scientific" efforts to explain natural phenomena.

LING 321 Phonology I (3) Prerequisite: LING 240. Properties of sound systems of human languages, basic concepts and analytical techniques of generative phonology. Empirical limits imposed by viewing grammars as cognitive representations. Physiological properties and phonological systems; articulatory phonetics and distinctive feature theory.

LING 322 Phonology II (3) Prerequisite: LING 321. Continuation of LING 321. Development of theories of phonology. Criteria for revising theories.

LING 330 Historical Linguistics (3) A traditional presentation of language change. Language types and families, sounds and writing systems, grammatical categories. Reconstruction of proto-languages by internal and comparative methods.

LING 350 Philosophy of Language (3) Prerequisite: PHIL 170, 173 or 371, or LING 311. The nature and function of language and other forms of symbolism from a philosophical perspective.

LING 410 Grammar and Meaning (3) Prerequisite: LING 312. The basic notions of semantic theory: reference, quantification, scope relations, compositionality, thematic relations, tense and time, etc. The role these notions play in grammars of natural languages. Properties of logical form and relationship with syntax.

LING 411 Comparative Syntax (3) Prerequisite: LING 312. Comparison of data from a variety of languages with respect to some aspect of current versions of syntactic theory in order to investigate how parameters of universal grammar are fixed differently in different languages. Attempts to work out fragments of grammars for some languages.

LING 419 Topics in Syntax (3) Repeatable to a maximum of six credits if subject matter is different.

LING 420 Word Formation (3) Prerequisite: LING 322. Definition of shape and meaning of possible words, both across languages and within particular languages. Interaction between principles of word formation and other components of a grammar: syntax, logical form and phonology.

LING 421 Advanced Phonology (3) Prerequisite: LING 322. Topics in current phonological theory, as they relate to data from the sound systems of various languages. Segmental and prosodic analysis. Discussion of autosegmental theory, metrical theory, etc.

LING 429 Topics in Phonology (3) Repeatable to a maximum of six credits if subject matter is different.

LING 430 Language Change (3) Prerequisite: LING 240. Changes in grammars from generation to generation. Consequences for the theory of grammars. Traditional work on historical change.

LING 431 Indo-European Studies (3) Prerequisite: LING 330. Reconstruction of Proto-Indo-European according to the theories of the Neo-grammarians and their followers. The development of Proto-Indo-European into its descendant languages.

LING 439 Topics in Diachronic Linguistics (3) Repeatable to a maximum of six credits if subject matter is different.

LING 440 Grammars and Cognition (3) Prerequisite: LING 240. Relationship between the structure, development and functioning of grammars and the structure, development and functioning of other mental systems. Interpretations of experimental and observational work on children's language, aphasia, speech production and comprehension.

LING 445 Grammars and Performance (3) Prerequisite: LING 240. The ways in which a person's grammar can be put to use. The ways that grammars function in sentence processing, language parsers.

LING 451 Grammars and Variation (3) Prerequisite: LING 311. Grammars and the use of language in a variety of styles: formal, casual, literary, etc. Consequences for concepts of grammars. Variation theory. Literary styles.

LING 453 Mathematical Approachee to Language (3) Prerequisite: LING 312. The aspects of mathematics used in linguistic discussions: recursion theory, Chomsky's hierarchy of grammars, set theory, Boolean algebra , finite state grammars, context-free grammars, etc. Applications to theories of grammars. Formalizations of grammatical theories.

LING 455 Second Language Teaching (3) Relationship between theories of grammars, and techniques used for teaching and learning second languages, and for the teaching and learning of English in schools.

LING 457 Grammars and Discourse (3) Prerequisite: LING 240. The use of a person's grammar in communication, sentence production. Speech act theory, pragmatics.

LING 499 Directed Studies in Linguistics (1-3) Prerequisite: consent of instructor. Independent study or research on language under the supervision of a faculty member. Repeatable to a maximum of six credits if the subject matter is different.

MAPL — Applied Mathematics

MAPL 460 Computational Methods (3) Prerequisites: MATH 240, 241, and CMSC 110 or equivalent. Basic computational methods for interpolation, least squares, approximation, numerical quadrature, numerical solution of polynomial and transcendental equations, systems of linear equations and initial value problems for ordinary differential equations. Emphasis on the methods and their computational properties rather than on their analytic aspects. Listed also as CMSC 460. (Credit will be given for only one of the courses, MAPL 460 or MAPL 470.)

MAPL 470 Numerical Mathematics: Analysis (3) Prerequisites: MATH 240 AND 241, CMSC 110 or equivalent. The first half of a one-year introduction to numerical analysis at the advanced undergraduate level, supplemented with programming assignments. Interpolation, numerical differentiation and integration, solution of nonlinear equations, acceleration of convergence, numerical treatment of differential equations. Listed also as CMSC 470. (Credit will be given for only one of the courses, MAPL 460 or MAPL 470.)

MAPL 471 Numerical Mathematics: Linear Algebra (3) Prerequisites: MATH 240 and MATH 241, CMSC 110 or equivalent. The course, with MAPL/CMSC 470, forms a one-year introduction to numerical analysis at the advanced undergraduate level. Direct solution of linear systems, norms, least squares problems, the symmetric eigenvalue problem, basic iterative methods. Topics will be supplemented with programming assignments. (Listed also as CMSC 471.)

MAPL 477 Optimization (3) Prerequisite: CMSC 110; MATH 405 or MATH 401. Linear programming including the simplex algorithm and dual linear programs, convex sets and elements of convex programming, combinatorial optimization integer programming. (Listed also as CMSC 477.)

MAPL 498 Selected Topics in Applied Mathematics (1-3) Prerequisite: permission of the instructor. Topics in applied mathematics of special interest to advanced undergraduate students. May be repeated to a maximum of six credits if the subject matter is different.

MATH — Mathematics

MATH 001 Review of High School Algebra (3) Recommended for students who fail the qualifying examination for MATH 105, 110, 115. Special fee required in addition to the regular tuition charge. This course does not carry credit towards any degree at the University.

MATH 102 Introduction to Mathematics IA (1) Prerequisite: consent of department. First third of a three-course sequence equivalent to MATH 110. Graphing, properties of straight lines, properties of quadratic functions, change of coordinates. Students may not receive credit for both MATH 102 and MATH 110, nor may they receive credit for MATH 102 if taken after the completion of any math course numbered above 110.

MATH 103 Introduction to Mathematics IB (1) Prerequisite: MATH 102 and consent of department. Second third of a three-course sequence equivalent to MATH 110. Power functions, exponential functions, logarithmic functions and trigonometric functions. Students may not receive credit for both MATH 103 and MATH 110, nor may they receive credit for MATH 103 if taken after the completion of any math course numbered above 110.

MATH 104 Introduction to Mathematics IC (1) Prerequisite: MATH 103 and consent of department. Final third of a three-course sequence equivalent to MATH 110. Inequalities, linear inequalities, graphing systems of linear inequalities, linear programming. Students may not receive credit for both MATH 104 and MATH 110, nor may they receive credit for MATH 104 if taken after the completion of any math course numbered above 110.

MATH 105 Mathematical Ideas (3) Prerequisite: none. A survey of some different areas of mathematics. Intended for non-science majors who would like to see some non-standard mathematics applied to some everyday problems. Transoort networks, matching problems, critical path analysis, introduction to statistics and hypothesis testing, Euler's formula, planar graphs, polyhedra, and other selected topics. (Not preliminary to MATH 110).

MATH 110 Introduction to Mathematics I (3) Prerequisite: 2-1/2 years of college preparatory mathematics. If the student does not have a satisfactory SAT mathematics score, or did not take the SAT mathematics test, the student must take and pass a placement test, or take and pass MATH 001 before taking MATH 110. Linear programming, systems of linear

equations, matrices; elementary algebraic and trancendental functions with emphasis on their properties and graphs (Not open to students majoring in mathematics, engineering or the physical sciences. Credit will be given for only one course, MATH 110 or MATH 115.)

MATH 111 Introduction to Mathematics II (3) Prerequisite: 3-1/2 years of college preparatory mathematics and satisfactory performance on the SAT mathematics test, or MATH 110, or MATH 115. Logic, Boolean algebra, counting, probability, random variables, expectation applications of the normal probability distribution. Credit will be given for only one of the courses, MATH 111 or STAT 100 (Not open to students majoring in Mathematics, Engineering or the Physical Sciences.)

MATH 115 Pre-Calculus (3) Prerequisite: 2-1/2 years of college preparatory mathematics. If the student does not have a satisfactory SAT mathematics score, or did not take the SAT mathematics test, the student must take and pass a placement test, or take and pass MATH 001 before taking MATH 115. An introductory course for students not qualified to start MATH 140 or MATH 220. Elementary functions and graphs: polynomials, rational functions, exponential and logarithmic functions, trigonometric functions (Credit will be given for only one course, MATH 115 or MATH 110.)

MATH 140 Calculus I (4) Three lectures, two drill periods per week. Prerequisite: 3 1/2 years of college preparatory mathematics (including trigonometry) or MATH 115. Introduction to calculus, including functions, limits, continuity, derivatives and applications of the derivative, sketching of graphs of functions, definite and indefinite integrals, and calculation of area. The course is especially recommended for science and mathematics majors. Credit will be given for only one course, MATH 140 or MATH 220.

MATH 141 Calculus II (4) Three lectures and two drill periods per week. Prerequisite: MATH 140 or equivalent. Continuation of MATH 140, including techniques of integration, improper integrals, applications of integration (such as volumes, work, arc length, moments), inverse functions, exponential and logarithmic functions, sequences and series. Credit will be given for only one course, MATH 141 or MATH 221.

MATH 143 Computer Laboratory for MATH 141 (2) Prerequisite: MATH 140 or equivalent. Pre or corequisite: MATH 141. Four hours of laboratory per week. Application of computer methods to problems of the calculus.

MATH 150 Calculus I (Honors) (4) Prerequisite: approval of department. A rigorous treatment, with applications, of differential and integral calculus in one variable.

MATH 151 Calculus II (Honors) (4) Prerequisite: approval of department. A rigorous treatment, with applications, of differential and integral calculus in one variable.

MATH 210 Elements of Mathematics (4) Prerequisite: one year of college preparatory algebra. Required for majors in elementary education, and open only to students in this field. Topics from algebra and number theory, designed to provide insight into arithmetic: inductive proof, the natural number system based on the Peano axioms, mathematical systems, groups, fields, the system of integers; the system of rational numbers; congruence, divisibility, systems of numeration.

MATH 211 Elements of Geometry (4) Prerequisite: MATH 210 or equivalent. Structure of mathematics systems, algebra of sets, geometrical structures, logic, measurement, congruence, similarity, graphs in the plane, geometry on the sphere.

MATH 220 Elementary Calculus I (3) Prerequisite: three and one half years of college preparatory mathematics including Trig, and satisfactory performance on the SAT mathematics test, or MATH 110, or MATH 115. Basic ideas of differential and integral calculus, with emphasis on elementary techniques of differentiation and applications. Not open to students majoring in mathematics, engineering or the physical sciences. Credit will be given for only one course, MATH 140 or MATH 220.

MATH 221 Elementary Calculus II (3) Prerequisite: MATH 220, or MATH 140, or equivalent. Differential and integral calculus, with emphasis on elementary techniques of integration and applications. Not open to students majoring in mathematics, engineering or the physical sciences. Credit will be given for only one course, MATH 141 or MATH 221.

MATH 240 Introduction to Linear Algebra (4) Three lectures, two drill periods per week. Prerequisite: MATH 141 or equivalent. Basic concepts of linear algebra: vector spaces, applications to line and plane geometry, linear equations and matrices, similar matrices, linear transformations, eigenvalues, determinants and quadratic forms. Credit will be given for only one course, MATH 240 or MATH 400 or MATH 461.

MATH 241 Calculus III (4) Prerequisite: MATH 141 and any one of the following: MATH 240, or ENES 110, or PHYS 191. Introduction to multivariable calculus, including vectors and vector-valued functions, partial derivatives and applications of partial derivatives (such as tangent planes and LaGrange multipliers), multiple integrals, volume, surface area, and the classical theorems of Green, Stokes and Gauss.

MATH 246 Differential Equations For Scientists and Engineers (3) Prerequisite: MATH 141 or equivalent. An introduction to the basic methods of solving ordinary differential equations. Equations of first and second order, linear differential equations, Laplace Transforms, numerical methods, and the qualitative theory of differential equations.

MATH 250 Calculus III (Honors) (4) Prerequisite: approval of department. Elements of linear algebra, Euclidean and other metric spaces; multi-variable calculus; implicit function theorem, theorems of Green, Gauss and Stokes. Riemann Stieltjes integral and, as time permits, ordinary differential equations, Fourier series, orthogonal functions.

MATH 251 Calculus IV (Honors) (4) Prerequisite: approval of department. Elements of linear algebra, Euclidean and other metric spaces; multi-variable calculus, implicit function theorem; theorems of Green, Gauss and Stokes. Riemann Stieltjes integral and, as time permits, ordinary differential equations, Fourier series, orthogonal functions.

MATH 299 Selected Topics in Mathematics (1-3) Prerequisite: permission of the instructor. Topics of special interest under the general guidance of the departmental committee on undergraduate studies.

MATH 310 Introduction to Mathematical Reasoning (3) Prerequisite: MATH 141. Recommended pre- or co-requisite: MATH 241. Intended to bridge the gap between calculus and advanced calculus. Introduction to the logical foundations of mathematics and to the technique of proving theorms. Topics drawn from logic, set theory, structure of the real line, elementary topology, convergence, functions, infinite sets, continuity. (This course cannot be used towards the upper level math requirements for MATH/STAT majors.)

MATH 398 Honors Seminar (2) Prerequisite: permission of the departmental honors committee. Reports by students on mathematical literature; solution of various problems.

MATH 400 Vectors and Matrices (3) Prerequisites: MATH 221 or equivalent. The essentials of matrix theory needed in the management, social and biological sciences. Main topics systems of linear equations, linear independence, rank, orthogonal transformations,eigenvalues, the principal axes theorem. Typical applications: linear models in economics and in statistics, Markov chains, age-specific population growth. Not open to students in the MPSE Division. Credit will be given for only one of MATH 240, MATH 400, or MATH 461.

MATH 401 Applications of Linear Algebra (3) Prerequisite: MATH 400, or MATH 240, or consent of instructor. Various applications of linear algebra: theory of finite games, linear programming, matrix methods as applied to finite Markov chains, random walk, incidence matrices, graphs and directed graphs, networks, transportation problems.

MATH 402 Algebraic Structuras (3) Prerequisite: MATH 240 or equivalent. For students having only limited experience with rigorous mathematical proofs, and parallels MATH 403. Students planning graduate work in mathematics should take MATH 403. Groups, rings, integral domains and fields; detailed study of several groups, properties of integers and polynomials. Emphasis is on the origin of the mathematical ideas studied and the logical structure of the subject. (Not open to mathematics graduate students. Credit will be given for only one of the courses, MATH 402 or MATH 403.)

MATH 403 Introduction to Abstract Algebra (3) Prerequisites: MATH 240 and MATH 241 or equivalent. Integers, groups, rings, integral domains, fields. (Credit will be given for only one of the courses, MATH 402 or MATH 403.)

MATH 404 Field Theory (3) Prerequisite: MATH 403. Algebraic and transcendental elements, Galois theory, constructions with straight-edge and compass, solutions of equations of low degrees, insolubility of the Quintic, Sylow theorems, fundamental theorem of finite Abelian groups.

MATH 405 Linear Algebra (3) Prerequisites: MATH 240 and MATH 403 or consent of instructor. An abstract treatment of finite dimensional vector spaces. Linear transformations and their invariants.

MATH 406 Introduction to Number Theory (3) Prerequisite: MATH 141, or MATH 221 or consent of instructor. Rational integers, divisibility, prime numbers, modules and linear forms, unique factorization theorem, Euler's function, Mobius' function, cyclotomic polynomial, congruences and quadratic residues, Legendre's and Jacobi's symbol, reciprocity law of quadratic residues, introductory explanation of the method of algebraic number theory.

MATH 410 Advanced Calculus I (3) Prerequisites: MATH 240 and MATH 241. First semester of a year course. Subjects covered during the year are sequences and series of numbers, continuity and differentiability of real valued functions of one variable, the Rieman integral, sequences of functions, and power series. Functions of several variables including partial derivatives, multiple integrals, line and surface integrals. The implicit function theorem.

MATH 411 Advanced Calculus II (3) Prerequisite: MATH 410, and MATH 240 or MATH 400. Continuation of MATH 410.

MATH 414 Differential Equations (3) Prerequisites: MATH 410, and MATH 240 or equivalent. Existence and uniqueness theorems for initial value problems. Linear theory: fundamental matrix solutions, variation of constants formula, floquet theory for periodic linear systems. Asymtotic orbital and Lyapunov stability with phase plane diagrams. Boundary value theory and series solutions.

MATH 415 Introduction to Partial Differential Equations (3) Prerequisites: MATH 246, and MATH 411 or MATH 251 (MATH 411 and MATH 415 may be taken concurrently). First order equations, linear second order equations in two variables, one dimensional wave equation and the method of separation of variables, and other topics such as harmonic functions, the heat equation, and the wave equation in space. (Credit will be given for only one of the courses MATH 415 or MATH 462)

MATH 417 Introduction to Fourier Analysis (3) Prerequisite: MATH 410. Fourier series. Fourier and laplace transforms.

MATH 430 Euclidean and Non-Euclidean Geometries (3) Prerequisites: Math 140-141 or equivalent. Hilbert's axioms for Euclidean Geometry. Neutral Geometry: the consistency of the hyperbolic parallel postulate and the inconsistency of the elliptic parallel postulate with neutral geometry. Models of hyerbolic geometry. Existence and properties of isometries.

MATH 432 Introduction to Point Set Topology (3) Prerequisite: MATH 410 or equivalent. Connectedness, compactness, transformations, homomorphisms, application of these concepts to various spaces, with particular attention to the Euclidean plane.

MATH 433 Introduction to Algebraic Topology (3) Prerequisite: MATH 403 and 432 or equivalent. Chains, cycles, homology groups for surfaces, the fundamental group.

MATH 436 Introduction to Differential Geometry (3) Prerequisites: MATH 241 and either MATH 240 or MATH 461, or equivalent. The differential geometry of curves and surfaces, curvature and torsion, moving frames, the fundamental differential forms, intrinsic geometry of a surface.

MATH 444 Elementary Logic and Algorithms (3) Prerequisite: MATH 240 or consent of instructor. An elementary development of propositional logic, predicate

logic, set algebra and Boolean algebra with a discussion of Markov algorithms, Turing machines and recursive functions. Topics include post productions, word problems, and formal languages (Also listed as CMSC 450)

MATH 446 Axiomatic Set Theory (3) Prerequisite: MATH 403 or 450 or consent of instructor. Development of a system of axiomatic set theory, choice principles, induction principles, ordinal arithmetic including discussion of cancellation laws, divisibility, canonical expansions, cardinal arithmetic including connections with the axiom of choice, Hartog's theorem, König's theorem, properties of regular, singular, and inaccessible cardinals.

MATH 447 Introduction to Mathematical Logic (3) Prerequisite: MATH 403 or 410 or 450. Formal propositional logic, completeness, independence, decidability of the system, formal quantificational logic, first-order axiomatic theories, extended godel completeness theorem, Lowenheim-Skolem theorem, model-theoretical applications.

MATH 450 Fundamental Concepts of Mathematics (3) Prerequisite: MATH 240 or consent of instructor. Sets, relations, mappings. Construction of the real number system starting with Peano postulates, algebraic structures associated with the construction; Archimedean order, sequential completeness and equivalent properties of ordered fields. Finite and infinite sets, denumberable and nondenumberable sets.

MATH 461 Linear Algebra For Scientists and Engineers (3) Prerequisites: MATH 141 and one MATH/STAT course for which MATH 141 is a prerequisite. Basic concepts of linear algebra. This course is similar to MATH 240, but with more extensive coverage of the topics needed in applied linear algebra: change of basis, complex eigenvalues, diagonalization, the Jordan canonical form. Credit will be given for only one of MATH 240, MATH 400 or MATH 461.

MATH 462 Partial Differential Equations For Scientists and Engineers (3) Prerequisites: MATH 241 and MATH 246. Linear spaces and operators, orthogonality, Sturm-Liouville problems and eigenfunction expansions for ordinary differential equations, introduction to partial differential equations, including the heat equation, wave equation and Laplace's equation, boundary value problems, initial value problems, and initial-boundary value problems. (Credit will be given for only one of the courses MATH 462 or MATH 415.)

MATH 463 Complex Variables For Scientists and Engineers (3) Prerequisite: MATH 241 or equivalent. The algebra of complex numbers, analytic functions, mapping properties of the elementary functions. Cauchy integral formula. Theory of residues and application to evaluation of integrals. Conformal mapping.

MATH 464 Transform Methods For Scientists and Engineers (3) Prerequisites: MATH 246 and MATH 463. Fourier series, Fourier and Laplace transforms. Evaluation of the complex inversion integral by the theory of residues. Applications to ordinary and partial differential equations of mathematical physics solutions using transforms and separation of variables. Additional topics such as Bessel functions and calculus of variations.

MATH 475 Combinatorics and Graph Theory (3) Prerequisite: MATH 240 and MATH 241. General enumeration methods, difference equations, generating functions. Elements of graph theory, matrix representations of graphs, applications of graph theory to transport networks, matching theory and graphical algorithms. (Also listed as CMSC 475.)

MATH 478 Selected Topics For Teachers of Mathematics (1-3) Prerequisite: one year of college mathematics or consent of instructor. (This course cannot be used toward the upper level math requirements for MATH/STAT majors.)

MATH 481 Introduction to Number Theory (3) Prerequisite: one year of college mathematics or consent of instructor. Elementary number theory and the development of the real numbers for teachers. (Not open to students majoring in mathematics or physical sciences.)

MATH 482 Introduction to Algebra (3) Prerequisite: one year of college mathematics or consent of instructor. Modern ideas in algebra and the theory of equations for teachers. (Not open to students majoring in mathematics or physical sciences.)

MATH 483 Introduction to Geometry (3) Prerequisite: one year of college mathematics or consent of instructor. A study of basic ideas from Euclidean and non-Euclidean geometry for teachers. (Not open to students majoring in mathematics or physical sciences.)

MATH 484 Introduction to Analysis (3) Prerequisite: one year of college mathematics or consent of instructor. A study of the limit concept and the calculus for teachers. Previous knowledge of calculus is not required. (Not open to students majoring in mathematics or physical sciences.)

MATH 488 National Science Foundation Summer Institute For Teachers of Science and Mathematics: Seminar (1-3) Lectures and discussion to deepen the student's appreciation of mathematics as a logical discipline and as a medium of expression. Special emphasis on topics relevant to current mathematical curriculum studies and revision. (Not open to students majoring in mathematics,not recommended for students majoring in any of the physical sciences.)

MATH 498 Selected Topics in Mathematics (1-16) Prerequisite: permission of the instructor. Topics of special interest to advanced undergraduate students will be offered occasionally under the general guidance of the departmental committee on undergraduate studies. Honors students register for reading courses under this number.

MEES — Marine - Estuarine - Environmental Sciences

MEES 440 Essentials of Toxicology (2) Prerequisite: BCHM 261 or 461. Principles involved in the assessment of responses of organisms to toxic chemicals, including systemic and organ toxicology, carcinogenesis, teratogenesis, and consideration of the effects of major groups of toxicants.

MEES 498 Topics in Marine-Estuarine-Environmental Sciences (1-4) Lecture and/or laboratory series organized to study a selected area of marine-estuarine-environmental sciences not otherwise considered in formal courses.

METO — Meteorology

METO 100 Weather and Life (3) A study of weather, how it works, and how it affects human endeavors. The energy of weather systems and the physics of storms and atmospheric air circulations, weather observations from earth and space, air pollution and acid rain, clouds, storms and unusual weather phenomena; the problem of weather prediction; weather modification; and the relations between weather and human health, agriculture, economics, and world history (METO 100 and METO 301 may not both be taken for credit).

METO 301 Introduction to Meteorology (3) Prerequisites: CHEM 113, PHYS 122 or equivalent. A broad survey of the state of knowledge and problems of atmospheric science. Origin and structure of the atmosphere, meteorological observations, weather maps, forecasting, satellites, energetics, wind, general circulation, storms, severe weather, climate change, air pollution, and weather modification. (METO 301 and METO 100 may not both be taken for credit).

METO 398 Topics in Atmospheric Science (3) Intended primarily for non-science majors. Study of some aspects of atmosphere sciences as applied to the environment. Repeatable to a maximum of six credits provided the subject matter is different.

METO 410 General Meteorology I (3) Prerequisite: MATH 241. Pre- or corequisite: PHYS 294 or 263. An introduction to the broad range of theoretical and applied studies in meteorology to acquaint the student with the interaction of the physical and dynamic processes and the various scales of atmospheric phenomena. Introduction to radiational energy transfer in the atmosphere, earth-atmospheric energy budgets, atmospheric thermodynamics.

METO 411 General Meteorology II (3) Prerequisite: METO 410. METO 460 suggested as a companion course. A continuation of METO 410 including an introduction to the concepts of vorticity and circulation in the atmosphere, properties of cold fronts and warm fronts, cyclones and anticyclones, air masses, thunderstorms, elements of dynamic weather forecasting, microphysics of cloud formation and precipitation, turbulence and diffusion in the atmosphere.

METO 412 Physics and Thermodynamics of the Atmosphere (3) Prerequisites: MATH 241, PHYS 263. An introduction to atmospheric radiation, cloud physics, and basic thermodynamic processes and applications to the atmosphere.

METO 416 Introduction to Atmospheric Dynamics (3) Prerequisites: MATH 241, 246, PHYS 263. The equations of atmospheric motion, coordinate systems, balanced flows and elementary application, divergence, circulation and vorticity, the planetary boundary layer, diagnostic analysis with the quasi-geotrophic equations.

METO 420 Physical and Dynamical Oceanography (3) Prerequisite: METO 410 or a basic course in fluid dynamics such as ENME 340. Historical review of oceanography, physical, chemical, stratification and circulation properties of the ocean, dynamics of frictionless, frictional, wind driven and thermohaline circulation; air-sea interactions.

METO 422 Oceanic Waves, Tides and Turbulence (3) Prerequisite: METO 420. Introduction to the theory of oceanic wave motions, tides, wind waves, swells, storm surges, seiches, tsunamis, internal waves, turbulence, stirring, mixing and diffusion; probability, statistics and time series.

METO 434 Air Pollution (3) Prerequisite: senior standing in science or engineering or consent of the instructor. Three lectures per week. Classification of atmospheric pollutants and their effects on visibility, inanimate and animate receptors. Evaluation of source emissions and principles of air pollution control; meteorological factors governing the distribution and removal of air pollutants, air quality measurements and air pollution control legislation.

METO 460 Synoptic Meteorology I (3) Pre- or corequisite: METO 411 or equivalent. Two three-hour lecture/ laboratory periods per week. The three-dimensional structure of synoptic scale systems and their relation to underlying dynamical principles. Weather map plotting and analysis techniques. Satellite imagery interpretation. Meteorological data acquisition and use.

METO 461 Synoptic Meteorology II (3) Prequisite: METO 460. Synoptic meteorology applied to the modern weather forecast. The history of forecasting. Polar Front theory, surface and upper air analysis, baroclinic instability, numerical forecasting, interpreting computer forecasts, probability forecasting, forecast evaluation.

METO 499 Special Problems in Atmospheric Science (1-3) Prerequisite: consent of instructor. Research or special study in the field of meteorology and the atmospheric and oceanic sciences. Repeatable to a maximum of 6 credits.

MICB — Microbiology

MICB 100 Basic Microbiology (4) Three lectures and one two-hour laboratory per week. An introduction to the world of microorganisms that is designed for the general student. A survey of microscopic life forms and their activities that emphasizes their importance for human welfare. This course is not intended for students majoring in biological or allied health sciences, and it cannot be used to fulfill the 24 credits required for a major in microbiology. Credit not allowed for both MICB 100 and MICB 200.

MICB 200 General Microbiology (4) Two lectures and two two-hour laboratory periods a week. Prerequisite: two semesters of chemistry. The biology of microorganisms, with special reference to the bacteria. Fundamental principles of microbiology as revealed through an examination of the structure, physiology, genetics, and ecology of microorganisms.

MICB 300 Microbiological Literature (1) One lecture period a week. Prerequisite: a major in microbiology. Introduction to periodical literature, methods, interpretation, and presentation of reports.

MICB 310 Applied Microbiology (4) Two lectures and two two-hour laboratory periods per week. Prerequisite: MICB 200. The application of microorganisms and microbiological principles to industrial processes. Control of microorganisms, sterilization, disinfection, antibiotics, industrial fermentations.

MICB 322 Microbiology and the Public (3) Three lectures per week. A course for general (non-science) students in which they will be made aware of the ways in which epidemic disease, water pollution, immunization requirements, solid waste disposal, and the like, impinge on current social and political problems in the American community.

MICB 360 Medical Virology (3) Prerequisite: MICB 200, for the student interested in a health related career. Focus on the host response to viral infection. Material includes summary of virus structure and multiplication, review of the biology of the immune response, and systematic coverage of the pathogenesis and pathology of major viral diseases.

MICB 379 Honors Research (2-3) Prerequisite: admission to departmental honors program. Research project carried out under guidance of faculty advisor. Repeatable to a total of 12 credits.

MICB 380 Bacterial Genetics (4) Prerequisites: CHEM 243 or 245 and 8 credits in microbiology. Two lectures and two-hour laboratory periods a week. Organization, replication, expression, mutation and transfer of the genetic material of bacteria and bacteriophages. Techniques of study.

MICB 388 Special Topics in Microbiology (1-4) Prerequisite: eight credits in microbiology, or consent of instructor. Presentation and discussion of special subjects in the field of microbiology. A maximum of four credit hours of MICB 388 may be applied to a major in microbiology.

MICB 399 Microbiological Problems (3) Prerequisite: 16 credits in microbiology registration only upon the consent of the instructor. This course is arranged to provide qualified majors in microbiology and majors in applied fields an opportunity to pursue specific microbiological problems under the supervision of a member of the department.

MICB 400 Systematic Microbiology (2) Two lecture periods a week. Prerequisite: 8 credits in microbiology or consent of instructor. History and philosophy of classification. Alpha, numerical and molecular genetic taxonomy. Methods used in microbial identification and classification.

MICB 410 History of Microbiology (1) Prerequisite: a major in microbiology or consent of instructor. History and integration of the fundamental discoveries of the science. Modern aspects of abiogenesis, fermentation, and disease causation in relation to early theories.

MICB 420 Epidemiology and Public Health (2) Prerequisite: MICB 200. History, characteristic features of epidemiology, the important responsibilities of public health, vital statistics.

MICB 430 Marine Microbiology (2) Prerequisite: MICB 200. Morphology, biochemistry and ecology of marine microorganisms including fungi, yeasts, bacteria and viruses. Properties of marine bacteria, such as luminescence, metal ion requirements for growth, production of ectocrine compounds, and sampling and culturing marine microorganisms.

MICB 431 Marine Microbiology Laboratory (3) One lecture and two three-hour laboratory periods per week. Prerequisites: MICB 200 and permission of the instructor. Morphology, biochemistry and ecology of marine microorganisms. Properties of marine bacteria, luminescence, metal ion requirements, ectocrine compound production, sampling and culturing. Laboratory may include sampling trips in Chesapeake Bay and a deep sea research cruise.

MICB 440 Pathogenic Microbiology (4) Two lectures and two two-hour laboratory periods a week. Prerequisite: MICB 200. The role of bacteria and fungi in the diseases of man with emphasis upon the differentiation and culture of microorganisms, types of disease, modes of disease transmission, prophylactic, therapeutic, and epidemiological aspects.

MICB 450 Immunology (4) Two lectures and two two-hour laboratory periodsJa week. Prerequisite: MICB 440. Principles of immunity hypersensitiveness. Fundamental techniques of immunology. Credit not given for both ZOOL 455 and MICB 450.

MICB 460 General Virology (3) Prerequisite: MICB 440 or equivalent. Discussion of the physical and chemical nature of viruses, virus cultivation and assay methods, virus replication, viral diseases with emphasis on the oncogenic viruses, viral genetics, and characteristics of the major virus groups.

MICB 470 Microbial Physiology (3) Prerequisite: MICB 200. Pre- or co-requisite: BCHM 462. Microbial cellular and population growth. Fermentation metabolism, physiology of anaerobiosis, and energy conservation and transformation in bacterial membranes. Efficiency of energy utilization for growth. Membrane structure and transport. Bacterial chemotaxis. Regulation of bacterial chromosome replication, RNA and protein synthesis. Control of metabolic pathways.

MICB 480 Microbial Ecology (3) Prerequisites: MICB 200 and CHEM 243 or 245. Interaction of microorganisms with the environment, other microorganisms and with higher organisms. Roles of microorganisms in the biosphere. Microorganisms and current environmental problems.

MICB 490 Microbial Fermentations (2) Second semester. Two lecture periods a week. Prerequisite: MICB 470. Principles and practice in industrial fermentation processes, and the study of fermentative metabolism in microorganisms.

MICB 491 Microbial Fermentations Laboratory (2) Second semester. Two two-hour laboratory periods a week. Prerequisite: MICB 490, or concurrent registration in MICB 490, and consent of instructor. Methods for the conduct, control and analysis of fermentation processes.

MUED — Music Education

MUED 197 Pre-Professional Experiences (1) An orientation into the role of the music teacher in the school and community. Class meets one hour a week for planning and discussion. Students spend one afternoon a week assigned to various music education activities. Limited to music education majors.

MUED 352 Music For the Elementary Classroom Teacher (2-3) Prerequisite: MUSC 155 or consent of instructor. For non-music majors. Methods for guiding elementary school students in musical experiences, development of objectives, and a survey of instructional materials.

MUED 410 Instrumental Arranging (2) Prerequisites: MUSC 250 and permission of instructor. Arranging for school bands and orchestras from the elementary through high school levels.

MUED 411 Instrumental Music: Methods and Materials For the Elementary School (3) A comprehensive study of instructional materials and teaching techniques for beginning instrumental classes—winds, strings and percussion.

MUED 420 Instrumental Music: Methods, Materials and Administration For Secondary School (2) A comprehensive study of instructional and program materials, rehearsal techniques and program planning for junior and senior High School bands and orchestras. Organization, scheduling, budgeting and purchasing are included.

MUED 438 Special Problems in the Teaching of Instrumental Music (2-3) Prerequisite: MUSC 113-213 or the equivalent. A study, through practice on minor instruments, of the problems encountered in public school teaching of orchestral instruments. Literature and teaching materials, minor repairs, and adjustment of instruments are included. The course may be taken for credit three times since one of four groups of instruments strings, woodwind, brass or percussion will be studied each time the course is offered.

MUED 450 Music in Early Childhood Education (3) Prerequisite: MUSC 155 or equivalent. Creative experiences in songs and rhythms, correlation of music and everyday teaching with the abilities and development of each level, study of songs and materials, observation and teaching experience with each age level.

MUED 460 Creative Activities in the Elementary School (2-3) Prerequisite: music methods or teaching experience. A study of the creative approach to the development of music experiences for children in the elementary grades emphasizing contemporary music and contemporary music techniques.

MUED 470 General Concepts For Teaching Music (1) Corequisite: MUED 411 or 471. Basic philosophical, psychological educational considerations for a total music program K-12, strategies for teaching tonal and rhythmic concepts, evaluation techniques and field experiences in designated schools.

MUED 471 Methods For Teaching Elementary General Music (3) A study of curriculum, materials, and teaching techniques for the development of meaningful music experiences which contribute to a sequential musical growth for children in the elementary schools.

MUED 472 Choral Techniques and Repertoire (2) Prerequisites: MUED 470 and MUSC 490. Rehearsal techniques for developing appropriate diction, tone, production, intonation, phrasing, and interpretation of choral music; examination of a wide variety of repertoire for use by choral performing groups on the elementary and secondary levels.

MUED 478 Special Topics in Music Education (1-2) Prerequisite: MUED 470 or consent of department. Each topic focuses on a specific aspect of the music instructional program; collectively, the topics cover a wide range of subject matter relevant to today's schools. May be repeated to a maximum of six credits.

MUED 480 The Vocal Music Teacher and School Organization (2) Prerequisite: student teaching, previous or concurrent. The role of the vocal music specialist in the implementation of the supervision and administration of the music programs in the elementary and secondary schools. Open to graduate students by permission of instructor.

MUED 499 Workshops, Clinics, Institutes (2-6) Innovative and experimental dimensions of music education will be offered to meet the needs of music teachers and music supervisors and to allow students to individualize their programs. The maximum number credits that may be earned under this course symbol toward any degree is six semester hours; the symbol may be used two or more times until six semester hours have been reached.

MUSC — Music

MUSC 100 Beginning Class Voice (2) Four hours per week. A laboratory course involving a variety of voices and vocal problems. Principles of correct breathing as applied to singing, fundamentals of tone production and diction. Repertoire of folk songs and songs of the Classical and Romantic periods. Development of students' voices.

MUSC 102 Beginning Class Piano I (2) Four hours per week. Functional piano training for beginners. Development of techniques useful for school and community playing. Basic piano techniques: chord, arpeggio, and scale techniques; melody and song playing; simple accompaniments; improvisation for accompaniments and rhythms; sight reading and transposition; and playing by ear.

MUSC 103 Beginning Class Piano II (2) Four hours per week. Functional piano training for beginners. Development of techniques useful for school and community playing. Basic piano techniques: chord, arpeggio, and scale techniques; melody and song playing; simple accompaniments; improvisation for accompaniments and rhythms; sight reading and transposition; and playing be ear. MUSC 103 is a continuation of MUSC 102; elementary repertoire is begun.

MUSC 104 Beginning Folk Guitar Class (2) Basic techniques of folk guitar. Emphasis on performance of traditional and contemporary folk music literature.

MUSC 106 Beginning Classical Guitar Class (2) Basic techniques of classical guitar. Music reading skills and musical interpretation; excercises to develop technical competency.

MUSC 110 Class Study of String Instruments (2) Open only to majors in music education (vocal option). Four laboratory hours per week. Basic principles of string playing, and a survey of all string instruments.

MUSC 111 Class Study of Wind and Percussion Instruments (2) Open only to majors in music education (vocal option). Four laboratory hours per week. A survey of wind and percussion instruments with emphasis on ensemble training. The student will acquire an adequate playing technique on one instrument and gain an understanding of the acoustical and construction principles of the others.

MUSC 113 Class Study: Violin (2) Open only to majors in music education (instrumental option). Four

laboratory hours per week. A study of the violin with emphasis on ensemble training. The student will acquire an adequate playing technique.

MUSC 114 Class Study: Cello and Bass (2) Open only to majors in music education (instrumental option). Four laboratory hours per week. A study of the instruments with emphasis on ensemble training. The student will acquire an adequate playing technique.

MUSC 116 Class Study: Clarinet (2) Open only to majors in music education (instrumental option). Four laboratory hours per week. A study of the clarinet with emphasis on ensemble training. The student will acquire an adequate playing technique.

MUSC 117 Class Study: Flute, Oboe, Bassoon, and Saxophone (2) Open only to majors in music education (instrumental option). Four laboratory hours per week. A study of the instruments with emphasis on ensemble training. The student will acquire an adequate playing technique on two to four instruments, and an understanding of the acoustical and construction principles of the others.

MUSC 120 Class Study: Cornet (2) Open only to majors in music education (instrumental option). Four laboratory hours per week. A study of the cornet with emphasis on ensemble training. The student will acquire an adequate playing technique.

MUSC 121 Class Study: Horn, Trombone, Euphonium, and Tuba (2) Open only to majors in music education (instrumental option). Four laboratory hours per week. A study of the instruments with emphasis on ensemble training. The student will acquire an adequate playing technique on two to four instruments, and an understanding of the acoustical and construction principles of the others.

MUSC 122 Class Study: Percussion (2) Open only to majors in music education (instrumental option). Four laboratory hours per week. A study of the instruments with emphasis on ensemble training. The student will acquire an adequate playing technique on two to four instruments, and an understanding of the acoustical and construction principles of the others.

MUSC 123 Movement For Singers (1) Systematic exercises, improvisations and dances in conjunction with artistic vocal expression. Performance and critique of stage deportment, gestures and recital techniques.

MUSC 126 Vocal Diction: English and Latin (1) Augmentation of private voice study. Phonetics and diction for singers of English and Latin vocal literature.

MUSC 127 Vocal Diction: Italian and Spanish (1) Augmentation of private voice study. Phonetics and diction for singers of Italian and Spanish vocal literature.

MUSC 128 Sight Reading For Pianists (2) A course to give the piano major an opportunity to develop proficiency in sight reading at the keyboard. Repeatable to a maximum of 4 credits.

MUSC 129 Ensemble (1) Three laboratory hours per week. Rehearsal and performance of selected works for small ensembles of instruments, piano, or small vocal groups. After two registrations in MUSC 129 the student will elect MUSC 229 for two additional semesters, and MUSC 329 thereafter.

MUSC 130 Survey of Music Literature (3) Three lectures and one laboratory hour per week. Open to all students except music and music education majors. MUSC 130 and 131 may not both be taken for credit. A study of the principles upon which music is based, and an introduction to the musical repertoires performed in America today.

MUSC 135 Basic Notational Skills (2) Three hours per week. An introductory course in fundamentals of music notation and the development of aural skills. May not be used in fulfillment of degree requirements by majors in music.

MUSC 140 Music Fundamentals I (3) An introductory theory course for the non-music major. Notation, scales, intervals, triads, rhythm, form, and basic aural skills.

MUSC 141 Music Fundamentals II (3) Prerequisite: MUSC 140 or permission of instructor. Continuation of MUSC 140. Introduction to counterpoint, contemporary idioms, improvisation and student compositions.

MUSC 150 Theory of Music I (3) Prerequisite: departmental audition and entrance examination. Limited to music majors. A study of basic concepts and skills in tonal melody and harmony through analysis and composition.

MUSC 151 Theory of Music II (3) Prerequisite: MUSC 150 with a minimum grade of C. A continuation of MUSC 150, including study of more advanced harmonic techniques of the eighteenth century, such as modulation and chromatic harmonies. Emphasis on sight singing, ear training, analysis, and compositional skills.

MUSC 155 Fundamentals For the Classroom Teacher (3) Open to students majoring in elementary education or childhood education; other students take MUSC 150. MUSC 150 and 155 may not both be counted for credit. The fundamentals of music theory and practice, related to the needs of the classroom and kindergarten teacher, and organized in accord with the six-area concept of musical learning.

MUSC 200 Intermediate Class Voice I (2) Fours hours per week. Prerequisite: MUSC 100 or equivalent vocal training. Continuation of MUSC 100, with more advanced repertoire for solo voice and small ensembles. A special section for music education majors will include the study of methods and materials for teaching class voice.

MUSC 201 Intermediate Class Voice II (2) Fours hours per week. Prerequisite: MUSC 200 or equivalent vocal training. Continuation of MUSC 200.

MUSC 202 Intermediate Class Piano I (2) Four hours per week. Prerequisite: MUSC 103 or equivalent piano training. Advanced keyboard techniques. Continuation of skills introduced in MUSC 103. Transposition, modulation, and sight reading; methods of teaching functional piano.

MUSC 203 Intermediate Class Piano II (2) Four hours per week. Prerequisite: MUSC 202 or equivalent piano training. Advanced keyboard techniques. Continuation of skills introduced in MUSC 202. Transposition, modulation, and sight reading; methods of teaching functional piano. Development of style in playing accompaniments and in playing for community singing. More advanced repertoire.

MUSC 204 Intermediate Folk Guitar Class (2) Prerequisite: MUSC 104 or equivalent. Continuation of skills introduced in MUSC 104.

MUSC 206 Intermediate Classical Guitar Class (2) Prerequisite: MUSC 106 or permission of instructor. Continuation of skills introduced in MUSC 106, including transcribing music for the guitar.

MUSC 213 Advanced Class Strings (2) Open only to majors in music education (instrumental option). Four laboratory hours per week. A study of the instruments with emphasis on ensemble training.

MUSC 215 The Art of the Performer (3) A study of music as recreated and communicated by one or more performers through recital-lecture programs. The soloist, the ensemble performer, the conductor, style, technique, and interpretation, programming, listener, audience, and media. Presentations by Department of Music performance faculty, students, and, when possible, visiting artists. Open to non-music majors.

MUSC 217 Class Composition I (2) Prerequisite: MUSC 151 and permission of instructor. Principles of musical composition and their application to the smaller forms. Original writing in nineteenth and twentieth century musical idioms for various media.

MUSC 218 Class Composition II (2) Prerequisite: MUSC 217 and permission of instructor. Continuation of MUSC 217. May be repeated for credit, but only one successful attempt may be applied towards baccalaureate degree requirements.

MUSC 226 Vocal Diction: French (1) Augmentation of private voice study. Phonetics and diction for singers of French vocal literature.

MUSC 227 Vocal Diction: German (1) Augmentation of private study. Phonetics and diction for singers of German vocal literature.

MUSC 228 Accompanying For Pianist (2) Prerequisite: MUSC 128. A course to give the piano major experience in dealing with the problems of accompanying at an intermediate stage of difficulty. Guidance and instruction in class will be supplemented by extensive experience working as an accompanist in applied studios. Repeatable to a maximum of 4 credits.

MUSC 229 Ensemble (1) Three laboratory hours per week. Rehearsal and performance of selected works for small ensembles of instruments, piano, or small vocal groups. After two registrations in MUSC 129 the student will elect MUSC 229 for two additional semesters, and MUSC 329 thereafter.

MUSC 230 History of Music I (3) Prerequisite: MUSC 250 or equivalent. A historical study of western music from Corelli through Beethoven.

MUSC 248 Special Problems In Music (2-3) Prerequisite: permission of instructor. Designed to allow a student of theory or music history to pursue a specialized topic or project under the supervision of a faculty member. Repeatable to a maximum of six credits.

MUSC 250 Advanced Theory of Music I (4) Prerequisite: MUSC 151 with a minimum grade of C. A continuation of MUSC 151, with further study of chromatic and modulatory techniques of the nineteenth century. Emphasis on sight singing, ear training, analysis, and compositional skills.

MUSC 251 Advanced Theory of Music II (4) Prerequisite: MUSC 250 with a minimum of C. A continuation of MUSC 250, concentrating on late nineteenth-century chromatic harmony and an introduction to twentieth-century melody and harmony. Emphasis on sight singing, ear training, analysis, and compositional skills.

MUSC 328 Chamber Music Performance For Pianists (2) A course to give the piano major experience in dealing with the problems of playing chamber music at a moderately difficult level. Class instruction will center around actual rehearsal and performance situations and will be supplemented by further experience working in chamber ensemble in applied studios. Repeatable to a maximum of 4 credits.

MUSC 329 Ensemble (1) Three laboratory hours per week. Rehearsal and performance of selected works for small ensembles of instruments, piano, or small vocal groups. After two registrations in MUSC 129 the student will elect MUSC 229 for two additional semesters, and MUSC 329 thereafter.

MUSC 330 History of Music II (3) Prerequisite: MUSC 250 or equivalent. A historical study of western music from the Romantic era to the present.

MUSC 331 History of Music III (3) Prerequisites: MUSC 230 AND 330. A historical study of western music from Antiquity through the Baroque, ending with a review of all periods of music history.

MUSC 338 Special Topics In Music and Art (3) Variable topics as announced. Repeatable to a maximum of six credits. (Listed also as ARTH 338.)

MUSC 339 Honors In Music (3) Prerequisite: approval of the honors committee. Corequisite: concurrent enrollment in MUSC 349. The production of one or more recitals or lecture-recitals; one or more compositions, or one or more honors theses in addition to regular degree requirements. Two semesters required. Repeatable to a maximum of 6 credits.

MUSC 340 Music Literature Survey I (3) Prerequisite: MUSC 130 or equivalent. Limited to non-music majors. Masterpieces of the symphonic and operatic repertory including works selected from Bach, Mozart, Beethoven, Brahms, Wagner, Verdi, and Debussy.

MUSC 341 Music Literature Survey II (3) Prerequisite: MUSC 130 or equivalent. Limited to non-music majors. Specialized music repertory, including medieval, liturgical drama, Handel trio sonatas, Schubert Lieder, Bartok string quartets, electronic music.

MUSC 345 Jazz Theory and Improvisation I (3) Prerequisite: MUSC 251 or permission of the instructor. Jazz theory, notational conventions, improvisation techniques, reading and analysis of music, and performance in small combo format.

MUSC 346 Jazz Theory and Improvisation II (3) Prerequisite: MUSC 345 or permission of instructor. Continuation of MUSC 345 including scoring and transcription.

MUSC 349 Honors Seminar In Music (1) Corequisite: concurrent enrollment in MUSC 339. Group discussion of projects undertaken in MUSC 339. Two semesters required. Repeatable to a maximum of 2 credits.

MUSC 355 Music in Recreation (3) Prerequisite: MUSC 155 or equivalent. An advanced course in music programs, materials and skills for the program specialist involved with planning music activities for leisure and recreation in community and clinical settings.

MUSC 358 Aural Musical Skills (2) Advanced skills in perceiving pitch, melody, rhythm, harmony, texture, and timbre in a variety of media. May be repeated to a maximum of 4 credits.

MUSC 379 Opera Workshop (2) Ten hours per week. Open to music and non-music majors (by audition). Operatic production and performance, performance techniques and coaching, stage direction, set design, costume design, and make-up. Repertoire will include smaller operatic works, excerpts, or scenes. Repeatable to a maximum of eight credits.

MUSC 388 Music Internship (3) Prerequisite: permission of department chairman. Corequisite MUSC 389. Pre-professional field work in music. Repeatable to a maximum of six credits.

MUSC 389 Music Internship Analysis (1) Corequisite: MUSC 388. Documentation and evaluation of field work experience. Repeatable to a maximum of two credits.

MUSC 400 Music Pedagogy (3) Conference course. Prerequisite or corequisite: MUSC 418, or a more advanced course in applied music. A study of major pedagogical treatises in music, and an evaluation of pedagogical techniques, materials, and procedures.

MUSC 415 Music Management (3) Prerequisite: permission of department chairman. Application of management concepts to music administration.

MUSC 428 Repertoire Coaching of Vocal or Chamber Music (2) Prerequisite or corequisite: MUSC 328. A course for piano students who wish to go further than the work offered in MUSC 128, 228, and 328 by becoming specialists in the areas of vocal coaching or chamber music coaching. Elements of pedagogy, conducting, and responsible artistic decision-making for the entire musical production.

MUSC 429 Opera Theater (2-3) Ten hours per week. Open to music and non-music majors with consent of director. Advanced techniques of operatic production; preparation, rehearsal, and performance of operatic works from both the traditional and contemporary repertory. Repeatable to a maximum of twelve credits.

MUSC 432 Music in World Cultures I (3) Prerequisite: MUSC 130 or permission of instructor. Asian musics from Japan to the Arab countries analyzed in terms of musical, social and aesthetic approaches.

MUSC 433 Music in World Cultures II (3) Prerequisite: MUSC 130 or permission of instructor. Music of the Balkans, Africa, South and North America analyzed in terms of musical, social and aesthetic interrelationships.

MUSC 436 Jazz: Then and Now (3) Major styles and influential artists of the past 75 years of jazz.

MUSC 438 Area Studies in Ethnomusicology (3) Prerequisite: MUSC 432 or 433 or equivalent. Advanced study of musics in selected regions of the world. Repeatable to a maximum of nine credits provided content is different.

MUSC 439 Collegium Musicum (1) Prerequisite: permission of the instructor. Open to undergraduates and graduates, music majors and non-majors. Procurement, edition, and performance of music not belonging to a standard repertory: early music, compositions for unusual performing media, works which demand reconstruction of their original circumstances of performance. Outcome of a semester's work may be one or more performances for the public. May be repeated for credit five times.

MUSC 443 Solo Vocal Literature (3) Prerequisite: MUSC 330, 331 or the equivalent. The study of solo vocal literature from the Baroque Cantata to the Art Song of the present. The Lied, Melodie, vocal chamber music and the orchestral song are examined.

MUSC 445 Survey of the Opera (3) Prerequisite: MUSC 330, 331, or the equivalent. A study of the music, librettos and composers of the standard operas.

MUSC 448 Special Topics in Music (2-6) Prerequisite: permission of the instructor. Repeatable to a maximum of six semester hours.

MUSC 450 Musical Form (3) Prerequisite: MUSC 251. A study of the principles of organization in music with emphasis on eighteenth and nineteenth century European music. Reading and analysis of scores exemplifying the musical forms.

MUSC 451 Analysis of Music (3) Prerequisite: MUSC 450 or permission of instructor. An advanced course in the analysis of tonal music. Discussion of individual works, with emphasis on their unique characteristics and on the relation of analysis to performance.

MUSC 452 Keyboard Harmony (2) Prerequisite: MUSC 251. Keyboard performance of musical score for vocal and instrumental ensembles and keyboard realization of basso continuo parts.

MUSC 453 Class Study of Guitar and Recorder (2) Prerequisite: consent of instructor or any four of the following: MUSC 102, 103, 113, 114, 116, 117, 120, 121, 202, 203. Three hours per week. Study and development of instrumental technique, pedagogical practices, and materials relating to group performance.

MUSC 457 Electronic Music Composition (2) Prerequisite: MUSC 250 and permission of instructor. Theory and practice of electronic music, electronically-generated sound, and its modulation in the voltage-controlled studio.

MUSC 460 Tonal Counterpoint I (2) Prerequisite: MUSC 251 or permission of instructor. A course in eighteenth-century contrapuntal techniques, analysis and original composition of two-voice dances, preludes, and inventions.

MUSC 461 Tonal Counterpoint II (2) Prerequisite: MUSC 460. A continuation of MUSC 460. Analysis and original composition of larger works displaying imitation in more than two voices, including the chorale prelude and fugue.

MUSC 462 Modal Counterpoint (2) Prerequisite: MUSC 251 or the equivalent. An introduction to the contrapuntal techniques of the sixteenth century: the structure of the modes, composition of modal melodies, and contrapuntal writing for two, three and four voices.

MUSC 465 Canon and Fugue (3) Prerequisite: MUSC 461 or the equivalent. Composition and analysis of the canon and fugue in the styles of the eighteenth, nineteenth and twentieth centuries.

MUSC 466 Structural Counterpoint (3) Prerequisite: MUSC 461 or permission of the instructor. A study of counterpoint and its role in articulating large-scale tonal structures with emphasis on analysis and written exercises.

MUSC 467 Piano Pedagogy I (3) A study of major pedagogical treatises in music, and an evaluation of pedagogical techniques, materials, and procedures.

MUSC 468 Piano Pedagogy II (3) Prerequisite: MUSC 467. Application of the studies begun in MUSC 467 to the actual lesson situation. Evaluation of results. May be repeated once for credit.

MUSC 470 Harmonic and Contrapuntal Practices of the Twentieth Century (2) Prerequisite: MUSC 251 or equivalent. A theoretical and analytical study of twentieth century materials.

MUSC 471 Contemporary Compositional Techniques (2) Prerequisite: MUSC 470 or permission of instructor. Continuation of MUSC 470, with emphasis on the analysis of individual works written since 1945.

MUSC 480 Music in Antiquity and the Middle Ages (3) Survey of western music from Hellenic times to 1450.

MUSC 481 Music in the Renaissance (3) Survey of western music from 1450 to 1600.

MUSC 482 Music in the Baroque Era (3) Survey of western music from 1600 to 1750.

MUSC 483 Music in the Classic Era (3) Survey of western music from 1750 to 1820.

MUSC 484 Music in the Romantic Era (3) Survey of western music from 1820 to 1900.

MUSC 485 Music in the 20Th Century (3) Survey of western music from 1900 to the present.

MUSC 486 Orchestration I (2) Prerequisite: MUSC 251. A study of the ranges, musical functions and technical characteristics of the instruments and their color possibilities in various combinations. Practical experience in orchestrating for small and large ensembles.

MUSC 487 Orchestration II (2) Prerequisite: MUSC 486. A study of orchestration in the various historical periods, with emphasis upon stylistic writing projects.

MUSC 490 Conducting (2) Prerequisite: MUSC 251. Vocal and instrumental baton techniques.

MUSC 491 Conducting II (2) Prerequisite: MUSC 490 or the equivalent. Baton techniques applied to score reading, rehearsal techniques, tone production, style and interpretation.

MUSC 492 Keyboard Music I (3) The history and literature of harpsichord and solo piano music from its beginning to the romantic period. Emphasis is placed on those segments of repertoire which are encountered in performance and teaching situations at the present time.

MUSC 493 Keyboard Music II (3) Prerequisite: MUSC 492. The history and literature of harpsichord and solo piano music from the romantic period to the present. Emphasis is placed on those segments of repertoire which are encountered in performance and teaching situations at the present time.

MUSC 494 Survey of Theory (3) Prerequisite: MUSC 251. A study of the major contributions of music theorists from Greek antiquity through the twentieth century.

MUSC 495 Acoustics For Musicians (3) Prerequisites: MUSC 251 or the equivalent, and senior or graduate standing in music. The basic physics of music, acoustics of musical instruments and music theory, physiological acoustics, and musico-architectural acoustics.

MUSC 499 Independent Studies (2-3) Prerequisite: permission of instructor. Independent research on a topic chosen in consultation with the instructor, which may culminate in a paper or appropriate project. May be repeated once for credit.

MUSP — Music Performance

Undergraduate Music Performance Courses are available in three series:

Minor Series: 2-credits each course. Prerequisite: permission of department chairperson. Limited to music majors studying a secondary instrument and to non-music majors. Each course in the series must be taken in sequence. The initial election for all new students, both freshman and transfer, is 102. Transfer students are evaluated for higher placement after one semester of study. One-half hour private lesson per week plus assigned independent practice.

MUSP 102, 103 Freshman Courses.

MUSP 202, 203 Sophomore Courses.

MUSP 302, 303 Junior Courses.

MUSP 402, 403 Senior Courses.

Principal Series: 2 or 4 credits each course. Prerequisites: departmental audition, entrance examination, and permission of department chairperson. Limited to majors in music programs other than performance and composition. Each course in the series must be taken in sequence. The initial election for all new students, both freshman and transfer, is 109. Transfer students are evaluated for higher placement after one semester of study. One-hour private lesson per week plus assigned independent practice. Courses 109, 208, and 409 may be repeated once for credit, but only one successful attempt in each course may be applied towards baccalaureate degree requirements.

MUSP 109, 110, Freshman Courses.

MUSP 207, 208 Sophomore Courses.

MUSP 305, 306 Junior Courses.

MUSP 409, 410 Senior Courses. Recital required in MUSP 410.

Major Series: 2 or 4 credits each course. Prerequisites: departmental audition, entrance examination, and permission of department chairperson. Limited to majors in performance and composition. Each course in the series must be taken in sequence. The initial election for all new students, both freshman and transfer, is 119. Transfer students are evaluated for higher placement after one semester of study. One-hour private lesson per week plus assigned independent practice. Courses 119, 218, and 419 may be repeated once for credit, but only

one successful attempt in each course may be applied towards baccalaureate degree requirements.

MUSP 119, 120 Freshman Courses.

MUSP 217, 218 Sophomore Courses.

MUSP 315, 316 Junior Courses.

MUSP 419, 420 Senior Courses. Recital required in MUSP 420. Instrument designation each student taking a music performance course must indicate the instrument chosen by adding a suffix to the proper course number, such as: MUSP 102A music performance—piano. A—piano; B—voice, C—violin; D—viola, E—cello; F—bass, G—flute, H—oboe, I—clarinet, J—basson, K—saxophone; L—horn, M—trumpet, N—trombone; O—tuba, P—euphonium; Q—percussion; R—organ, S—guitar, T—composition; U—world instruments; V—harp, W—electronic composition; X—hist inst - keyboard, Y—hist inst - strings; Z—hist inst - winds.

NUSC — Nutritional Science

NUSC 402 Fundamentals of Nutrition (3) Prerequisite: CHEM 104, ANSC 212 and BCHM 261 recommended. A study of the fundamental role of all nutrients in the body including their digestion, absorption, and metabolism. Dietary requirements and nutritional deficiency syndromes of laboratory and farm animals and man.

NUSC 403 Applied Animal Nutrition (3) Two lectures and one laboratory period per week. Prerequisites: MATH 110, NUSC 402 or permission of instructor. A critical study of those factors which influence the nutritional requirements of ruminants, swine and poultry. Practical feeding methods and procedures used in formulation of economically efficient rations will be presented.

NUSC 425 International Nutrition (3) Prerequisite: course in basic nutrition. Nutritional status of world population and local, national, and international programs for improvement.

NUSC 450 Advanced Human Nutrition (3) Prerequisites: consent of department: NUTR 300 and BCHM 261 or concurrent registration in BCHM 462. Two lectures and one three-hour laboratory per week. A critical study of the physiological and metabolic influences on nutrient utilization, with particular emphasis on current problems in human nutrition.

NUSC 460 Therapeutic Human Nutrition (3) Two lectures and one laboratory period per week. Prerequisites: NUTR 300 and NUTR 450. Modifications of the normal adequate diet to meet human nutritional needs in pathological conditions.

NUSC 463 Nutrition Laboratory (2) Prerequisite: ANSC 401/NUSC 402 or concurrent registration. Six hours of laboratory per week. Digestibility studies with ruminant and monogastric animals, proximate analysis of various food products, and feeding trials demonstrating classical nutritional deficiencies in laboratory animals.

NUTR — Nutrition

NUTR 100 Elements of Nutrition (3) Three lectures per week. Fundamentals of human nutrition. Nutrient requirements related to changing individual and family needs. Credit will be given for only one course: NUTR 100 or NUTR 200.

NUTR 200 Nutrition For Health Services (3) Two lectures and one two-hour laboratory. Pre- or corequisite: CHEM 104, ZOOL 201 or 202. Nutrition related to maintenance of normal health and prevention of disease, nutritional requirements for individuals in different stages of development, current concerns in nutrition for the professional in health services. Credit will be given for only one course: NUTR 100 or 200.

NUTR 300 Science of Nutrition (4) Prerequisites: NUTR 100; ZOOL 202 or 211; and BCHM 261 or 461; or consent of instructor. Three lectures and one two-hour laboratory. An understanding of the chemical and physiological utilization of nutrients present in food as related to individual human nutrition status; digestion and absorption, requirements and deficiencies.

NUTR 315 Maternal, Infant and Child Nutrition (3) Prerequisite: NUTR 100 or 200. Nutritional needs of the mother, infant and child and the relation of nutrition to physical and mental growth. Intended primarily for non-majors.

NUTR 335 History of Nutrition (3) Prerequisite: course in basic nutrition. The development of knowledge in nutrition, including the biographies of creative nutrition researchers and the nature of the discovery process. The use of hypotheses to focus exploration and the testing and evaluation of important hypotheses in nutrition.

NUTR 425 International Nutrition (3) Prerequisite: course in basic nutrition. Nutritional status of world population and local, national, and international programs for improvement.

NUTR 430 Nutritional Biochemistry (3) Prerequisite: CHEM 261 or equivalent. Nutritional biochemistry with special emphasis on the relationship between biochemistry and nutrition.

NUTR 450 Advanced Human Nutrition (3) Prerequisites: consent of department, NUTR 300 and BCHM 261 or concurrent registration in BCHM 462. Two lectures and one three-hour laboratory per week. A critical study of the physiological and metabolic influences on nutrient utilization, with particular emphasis on current problems in human nutrition.

NUTR 460 Therapeutic Human Nutrition (3) Two lectures and one laboratory period a week. Prerequisites: NUTR 300, 450. Modifications of the normal adequate diet to meet human nutritional needs in pathological conditions.

NUTR 468 Practicum in Nutrition (1-6) Prerequisite: consent of the practicum advisor. Inservice training and practical experience in the application of the principles of normal and/or therapeutic nutrition in an approved community agency, clinical facility or nutrition research laboratory.

NUTR 470 Community Nutrition (3) Prerequisites: NUTR 300. A study of different types of community nutrition programs, problems and projects.

NUTR 475 Dynamics of Community Nutrition (3) Prerequisite: NUTR 470 or consent of instructor. The practice of community nutrition. Community assessment, nutrition program planning, implementation and evaluation; nutrition education and counseling; grantmanship; and the legislative process.

NUTR 490 Special Problems in Nutrition (2-3) Prerequisites: NUTR 300 and consent of instructor. Individual selected problems in the area of human nutrition.

NUTR 498 Special Topics (1-3) Prerequisite: consent of instructor. Selected current aspects of nutrition. Repeatable to a maximum of six credits if the subject matter is substantially different.

PERH — Physical Education, Recreation, and Health

PERH 487 Adult Health and Developmental Program (3) Prerequisite: consent of instructor. Training and experience in a clinically oriented development program for the aged.

PERH 488 Children's Health and Development Clinic (1-4) Prerequisite: consent of instructor. An opportunity to acquire training and experience in a therapeutically oriented physical education—recreation program for children referred by various education, special education, medical or psychiatric groups. Repeatable to a maximum of 4 credits.

PERH 490 Theories of Children's Love and Peace Behavior (3) The development of love and peace behaviors as health correlates in infra human and human species from infancy through childhood with special emphasis upon the role of physical education, recreation, and health. The examination of existing models in the areas of family, school, and clinical settings.

PHED — Physical Education

PHED Activities Program Courses: 1-3 credits per course

PHED 100—114 Physical Education Activities - Men

PHED 115—127 Physical Education Activites - Women

PHED 130—177 Physical Education Activites - Coed

PHED 158 Adapted Physical Education - Coed

PHED Professional Program Courses:

PHED 180 Foundations of Physical Education (3) Introduction to the study of physical education with attention to the foundations, content and practices of human movement as the focus. The course involves lecture, discussion, and laboratory components to explore, describe, and increase understanding of physical education as it is practiced and studied.

PHED 181 Fundamentals of Movement (2) Introduction to the scientific foundations of human movement including factual knowledge and application of content areas such as human growth and development, anatomy, physiology, neurology, biomechanics and motor learning to fundamental movement skills.

PHED 182 Rhythmic Activities (2) Six hours a week. Development of rhythmic sensitivity through analysis of rhythm and its application to movement, skills in folk, square and social dance, teaching techniques for use in schools and recreational programs.

PHED 183 Movement Content for Elementary School Children (3) Participation in movement activities with a focus on educational dance, gymnastics and games. Observation and analysis of movement behavior in relation to specific aspects of movement. Examination of relationships among movement forms.

PHED 200 Gymnastics Skills Laboratory (2) Progressive techniques of teaching and practice of skills in gymnastics.

PHED 201 Archery Skills Laboratory (1) Progressive techniques of teaching and practice of skills in archery.

PHED 202 Badminton Skills Laboratory (1) Progressive techniques of teaching and practice of skills in badminton.

PHED 203 Baseball Skills Laboratory (1) Progressive techniques of teaching and practice of skills in baseball.

PHED 204 Basketball Skills Laboratory (1) Progressive techniques of teaching and practice of skills in basketball.

PHED 205 Bowling Skills Laboratory (1) Progressive techniques of teaching and practice of skills in bowling.

PHED 206 Golf Skills Laboratory (1) Progressive techniques of teaching and practice of skills in golf.

PHED 207 Fencing Skills Laboratory (1) Progressive techniques of teaching and practice of skills in fencing.

PHED 210 Field Games Skills Laboratory (1) Progressive techniques of teaching and practice of skills in field games as flag football, soccer, speedball and speed-a-way.

PHED 211 Field Hockey Skills Laboratory (1) Progressive techniques of teaching and practice of skills in field hockey.

PHED 212 Football Skills Laboratory (1) Progressive techniques of teaching and practice of skills in football.

PHED 213 Lacrosse Skills Laboratory (1) Progressive techniques of teaching and practice of skills in lacrosse.

PHED 214 Soccer Skills Laboratory (1) Progressive techniques of teaching and practice of skills in soccer.

PHED 215 Softball Skills Laboratory (1) Progressive techniques of teaching and practice of skills in softball.

PHED 217 Tennis Skills Laboratory (1) Progressive techniques of teaching and practice of skills in tennis.

PHED 218 Laboratory in Teaching (1) Prerequisite: students are eligible who have completed a minimum of 36 semester hours of credit with appropriate knowledge and experience in the selected activity area or with permission of instructor. The course is designed to prepare the student for the student teaching experience by assisting in a class. May be repeated to a maximum of 2 credit hours.

PHED 220 Track and Field Skills Laboratory (2) Progressive techniques of teaching and practice of skills in track and field.

PHED 221 Volleyball Skills Laboratory (1) Progressive techniques of teaching and practice of skills in volleyball.

PHED 222 Weight Training Skills Laboratory (1) Progressive techniques of teaching and practice of skills in weight training.

PHED 223 Wrestling Skills Laboratory (1) Progressive techniques of teaching and practice of skills in wrestling.

PHED 224 Aerobics Skills Laboratory (1) Progressive techniques of teaching and practice of skills in aerobics.

PHED 250 Advanced Volleyball Skills Laboratory (2) Prerequisite PHED 221. Progressive techniques of teaching/coaching and practice of skills in volleyball at the advanced level.

PHED 261 Development of Endurance and Strength Fitness (3) Two lectures and one two-hour laboratory per week. An appraisal of various components of physical fitness and of a prescription exercise program. The parameters of physical fitness and the exercises to improve these parameters.

PHED 282 Techniques of Officiating (1) Emphasis on mechanics and techniques involved with officiating various sports. Opportunity to qualify for officials' ratings in sports such as basketball, field hockey and volleyball.

PHED 287 Sport and American Society (3) Sport will be related to such social problems as delinquency, segregation, collective behavior, and leisure, to social processes such as socialization, stratification, mobility, and social control; and to those familiar social institutions, the family, the school, the church, the military, the economy, the polity, and the mass media.

PHED 289 Topical Investigations (1-6) Independent study by an individual student or a group of students in special areas of knowledge not covered by regularly scheduled courses. Repeatable to a maximum of 6 credits.

PHED 290 Observation of Teaching Strategies in Physical Education (3) Two lectures and two hours of laboratory per week. Structured observation of children in physical education settings. Specific emphasis on analysis of the teaching/learning process and the selection and development of appropriate content.

PHED 293 History of Sport in America (3) The growth and development of sport in America. The transformation of sport within the perspective of American history, including class sport, professionalization, amateurism, and international involvement.

PHED 300 Kinesiology (4) Three lectures and two laboratory hours a week. Prerequisites ZOOL 201, 202. The study of human movement and the physical and physiological principles upon which it depends. Body mechanics, posture, motor efficiency, sports, the performance of a typical individual and the influence of growth and development upon motor performance.

PHED 301 Organization and Officiating in Intramurals (1) Organization, administration, and promotion of intramurals at various school levels. Included are types of tournaments, units of competition, handling of student leader personnel.

PHED 303 Organization and Officiating in Intramurals (1) Organization, administration, and promotion of intramurals at various school levels. Included are types of tournaments, units of competition, handling of student leader personnel.

PHED 304 Advanced Basketball Skills Laboratory (2) Progressive techniques of teaching and practice of skills in basketball at the advanced level. Prerequisite: PHED 204 or equivalent.

PHED 306 Advanced Golf Skills Laboratory (2) Progressive techniques of teaching and practice of skills in golf at the advanced level. Prerequisite: PHED 206 or equivalent.

PHEED 314 Methods in Physical Education (3) Application of educational philosophy and principles to class organization and techniques of teaching physical education.

PHED 315 Methods of Aquatics (2) Training for aquatic leadership in schools, camps and clubs. Included are teaching methods, organization and administration, analysis of the basic and competitive swimming strokes, diving, and equipment and pool maintenance. Prerequisite: WSI or instructor's permission.

PHED 316 Advanced Gymnastics Skills Laboratory (2) An analytical approach to teaching basic through advanced skills in gymnastics. Emphasis is placed on spotting, evaluating and the solving of motor performance problems. Prerequisite: PHED 200 and PHED 216 or equivalent.

PHED 317 Advanced Tennis Skills Laboratory (2) Progressive techniques of teaching and practice of skills in tennis at the advanced level. Prerequisite: PHED 217 or equivalent.

PHED 330 Fundamentals of Body Dynamics (3) Acquaintance of the elementary teacher with the scientific principles of mechanical-anatomical analysis and physiology of activities relating to physical growth and development.

PHED 333 Physical Activity for the Handicapped (3) Handicapped conditions, Federal and State regulations, implications for planning and implementing physical activity programs, evaluation strategies of assessing motor performance and the role of physical activity in educational programs for handicapped students.

PHED 334 Methods of Scuba Instruction (3) Prerequisites: basic scuba certification and verification of diving experience. An advanced course in scuba diving with emphasis on the instructional methods of teaching scuba. Included are teaching methods, organization and administration, legal aspects of scuba instruction, open water rescue and emergency procedures, advanced diving physics and physiology.

PHED 335 Swimming Pool Management (2) Analysis of the position of the swimming pool manager. The systematic treatment of swimming pool water, swimming pool first aid, and laws pertaining to swimming pool operation. Qualifies the student for a pool operator's license in most Maryland counties.

PHED 340 Theory of Coaching Athletics (2) General theory and practice of coaching selected competitive sports found in secondary schools and community recreation programs. Not open to students who have credit for PHED 324.

PHED 341 Theory of Coaching Basketball (2) Philosophy, preparation for season, practice organization, scouting, film analysis, and strategies. Not open to students who have credit for PHED 323.

PHED 342 Theory of Coaching Baseball (2) Philosophy, preparation for season, practice organization, scouting, film analysis, and strategies. Not open to students who have credit for PHED 325.

PHED 343 Theory of Coaching Football (2) Philosophy, preparation for season, practice organization scouting, film analysis, and strategies. Not open to students who have credit for PHED 323.

PHED 344 Theory of Coaching Swimming (2) Philosophy, preparation for season, practice organization, scouting, film analysis, and strategies. Not open to students who have credit for PHED 326.

PHED 345 Theory of Coaching Track and Field (2) Philosophy, preparation for season, practice organization, scouting, film analysis, and strategies. Not open to students who have credit for PHED 325.

PHED 346 Theory of Coaching Wrestling (2) Philosophy, preparation for season, practice organization, scouting, film analysis, and strategies. Not open to students who have credit for PHED 326.

PHED 350 The Psychology of Sports (3) An exploration of the personality factors, including, but not limited to motivation, agression and emotion, as they affect sports participation and motor skill performance.

PHED 351 Contemporary Issues in American Sport (3) Prerequisite: PHED 287. Seminar discussion of theoretical and practical issues in contemporary sport.

PHED 360 Physiology of Exercise (3) Two lectures and two laboratory hours per week. Prerequisites: ZOOL 101, 201 and 202 and consent of instructor. A study of the physiology of exercise, including concepts of work, muscular contraction, energy transformation, metabolism, oxygen debt, and nutrition and athletic performance. Emphasis on cardiovascular and respiratory function in relation to physical activity and training.

PHED 361 Weight Control Through Diet and Exercise (3) Lecture and laboratory. The basic principles of weight control are given and the students participate in diet and exercise programs.

PHED 362 Philosophy of Sport (3) Form and content of the philosophy of sport. The basis of knowledge in and about sport, the structure and theories of the discipline, the ontological and moral implications and dilemmas involving sport, and the interactions between philosophy and the scientific and humanistic aspects of sport.

PHED 370 Motor Development (3) Motor development across the life span. The developmental sequences of motor skills from birth to old age, neuromaturation of neuromuscular system, analysis of the underlying mechanisms of motor skill development, and correlates of motor development.

PHED 381 Prevention and Care of Athletic Injuries (3) Prerequisites: ZOOL 201 and 202. Theoretical and practical foundations of the prevention, recognition, and treatment of athletic injuries. Physical conditioning and re-conditioning preventive taping, first aid, and various modalities are emphasized.

PHED 385 Motor Learning and Skilled Performance (3) A study of the research dealing with motor learning and motor performance. Scientific methodology, individual differences, specificity, proprioceptive control of movement, motivation, timing, transfer, and retention.

PHED 389 Topical Investigations (1-3) Independent study by an individual student or a group of students in special areas of knowledge not covered by regularly scheduled courses. Repeatable to a maximum of six credits.

PHED 390 Practicum in Teaching Physical Education (3) Prerequisite: PHED 314. Two lectures and two hours of laboratory per week, in the teaching of children in a physical education setting. Specific emphasis on curriculum development, lesson planning, progressions and analysis of teacher behavior.

PHED 393 History of Ideas in American Sport (3) Prerequisite: PHED 293. The ideas, conflicts, and myths which influence American sport.

PHED 398 Honors Seminar (1) One discussion period a week. Prerequisite: participation in honors program. Guided discussion of research topics of current interest. Repeatable to a total of 3 hours credit.

PHED 399 Honors Thesis (3) Prerequisite: PHED 398H and candidacy for honors in physical education. Advisement will be on the individual basis. Thesis must be defended in the honors seminar.

PHED 401 Kinesiology For Dance (3) Mechanical and anatomical components of human movement. Integration of the scientific knowledge necessary to the dancer with the artistic aspects of dance. Practical experience in the application of kinesiological principles to dance and dance education. May not be taken for credit by students who have credit in PHED 400.

PHED 402 Biomechanics of Sport (3) Prerequisite: PHED 300. Mechanical determinants influencing sport techniques. A quantitative, scientific basis for sport analysis with emphasis on the application to numerous sport activities. Evaluation and quantification of the filmed performance of athletes.

PHED 406 Perceptual-Motor Development in the Young Child (3) Analysis of perceptual-motor components, their progression, interrelationships, developmental activities and evaluation. Study of the growth and other factors that influence perceptual-motor development in the young child.

PHED 420 Physical Education For the Elementary School (3) Orientation of the general elementary teacher to physical education. Principles and practices in elementary physical education are discussed and a variety of appropriate activities are considered.

PHED 421 Elementary School Physical Education: A Movement Approach (3) Prerequisites: PHED 183 and 184. An analysis of movement philosophy and content, focusing upon cognitive, psychomotor and affective developmental characteristics in relation to progression and planning of games, educational dance and educational gymnastices for elementary school age children.

PHED 450 Sport Psychology: Applications (3) Two hours of lecture, two hours of laboratory per week. Prerequisite: PHED 350. Application of the principles of sport psychology to the competitive or recreational athlete, with an emphasis on the techniques that have been used with competitors to maximize skill acquisition and performance.

PHED 451 Sport and the American Woman (3) The expanding perception of the woman's role in American society, etiology of sex differences, socialization of sex roles in America, development of "masculinity" and

"feminity" in children through early play experiences; competition and women, personality of the female athlete, and personal motivations of female athletes and projected future for sport and the American.

PHED 455 Scientific Bases of Athletic Conditioning (3) Prerequisite: PHED 360. An examination of physical fitness/athletic conditioning programs stressing the practical application of exercise physiology theory for enhancing athletic performance. Cardiovascular considerations, strength and power development, nutrition, speed, muscular endurance, environmental considerations and ergogenic aids.

PHED 461 Exercise and Body Composition (3) Prerequisite: PHED 360. Physiological concepts relating body composition factors to exercise and human performance. The scientific basis for the establishment and evaluation of conditioning programs where body composition may play an important role, such as weight control and athletics.

PHED 462 Neural Basis of Human Movement (3) Prerequisites: ZOOL 201, 202; PHED 385 or permission of instructor. An introduction to the neural substrates which underlie postural and volitional movement. Neuroanatomical and neurophysiological basis of motor functioning; past and present conceptualizations of motor control and coordination; movement disorders; and maturation of the neuromuscular system.

PHED 470 Seminar For Student Teachers (2) A seminar held concurrently with student teaching in physical education. An intensive examination of current problems and issues in teaching physical education.

PHED 480 Measurement In Physical Education (3) Two lectures and two laboratory periods a week. Prerequisite: MATH 105 or 110. A study of the principles and techniques of educational measurement as applied to teaching of physical education, study of the functions and techniques of measurement in the evaluation of student progress toward the objectives of physical education and in the evaluation of the effectiveness of teaching.

PHED 481 Biophysical Aspects of Human Movement (3) Prerequisites: PHED 300, 360, 370, 385. Scientific principles and research techniques in the investigation of the biophysical bases of human movement.

PHED 482 Socio-behavioral Aspects of Human Movement (3) Prerequisites: PHED 287, 293, 350. Derivation, formulation, and application of research in the socio-behavioral aspects of human movement.

PHED 486 Politics and Economics of Organized Contemporary Sport (3) Prerequisite: PHED 287. Interdependence of sport, politics, and economics. The structure, organization, and uses of sport in contemporary societies.

PHED 487 Physical Education and Sport In Contemporary Cultures (3) Three lectures a week. Prerequisite: SOCY 100 or equivalent. A study of the cultural impact of physical education activities in the United States and selected countries. Individual research on selected topics is required.

PHED 489 Field Laboratory Projects and Workshop (1-6) Workshops and research projects in special areas of knowledge not covered by regularly structured courses. Note: the maximum total number of credits that may be earned toward any degree in physical education is six.

PHED 490 Administration of Physical Education and Sport (3) Prerequisite: PHED 180 or PHED 287. Principles and functions of administration in physical education and sport. Administrative duties in relation to financing, budgeting, staffing, planning, organizing, directing, coordinating, evaluating, reporting, and discipline.

PHED 491 The Curriculum In Physical Education (3) Curriculum sources, principles, and planning concepts, with emphasis on using valid criteria for the selection of content for physical education programs.

PHED 492 History of the Sportswoman In American Organizations (3) Prerequisite: PHED 293. Women's involvement in and contributions to America's sporting culture, especially in the 19th and 20th Centuries until enactment of Title IX. The interactions among historical perceptions of women's roles, responsibilities, and potential and their sporting lives; the effects of role stereotyping and opportunities for and directions taken in developing sport organizations. Other issues affecting women's involvement in institutional sport.

PHED 493 History and Philosophy of Sport and Physical Education (3) History and philosophical implications of sport and physical education through ancient, medieval, and contemporary periods in western civilization.

PHED 494 History of Organized Sport In America 1870-1970 (3) Prerequisite: PHED 293. The development of organized amateur and professional sport in America since 1870. League and association formation and growth, promotion of, and challenges to the organizations.

PHED 495 Organization and Administration of Elementary School Physical Education (3) Prerequisite: PHED 420. Studies the procedures basic to satisfactory organization of all phases of the elementary school physical education program. Emphasis is placed on the organizational and administrative factors necessary for the successful operation of the program in various types of elementary schools.

PHED 496 Quantitative Methods (3) Statistical techniques most frequently used in research pertaining to physical education. Effort is made to provide the student with the necessary skills, and to acquaint him with the interpretations and applications of these techniques.

PHED 497 Independent Studies Seminar (3) Discussions of contemporary issues vital to the discipline, critiques of research in the student's area/areas of special interest, completion of a major project where the student will be asked to demonstrate the ability to carry out investigative processes in problem solving and critical writing under faculty direction.

PHED 498 Special Topics In Physical Education (3) Prerequisite: consent of instructor. Topics of special interest in areas not covered by regularly scheduled courses. Repeatable when the subject matter is different.

PHIL — Philosophy

PHIL 100 Introduction to Philosophy (3) An introduction to the literature, problems, and methods of philosophy either through a study of some of the main figures in philosophic thought or through an examination of some of the central and recurring problems of philosophy.

PHIL 110 Plato's Republic (3) Plato's Republic as a framework for examining philosophical issues pertaining to art, education, immortality, love, marriage, the mind, morality, the state, and the universe and our knowledge of it. The arguments Plato uses to support his views on these issues, his fusion of these views into a single comprehensive philosophy, and the influence of this philosophy on western thought and culture. Readings from other Platonic dialogues and from secondary material.

PHIL 140 Contemporary Moral Issues (3) The uses of philosophical analysis in thinking clearly about such widely debated moral issues as abortion, euthanasia, homosexuality, pornography, reverse discrimination, the death penalty, business ethics, sexual equality, and economic justice.

PHIL 142 Introduction to Ethical Theory (3) A critical examination of classical and contemporary systems of ethics, such as those of Aristotle, Kant, Mill, and Rawls.

PHIL 170 Introduction to Logic (3) A general introduction to the discipline of logic. Traditional and modern deductive techniques, informal fallacies.

PHIL 173 Logic and the English Language I (3) Basic techniques for analyzing deductive arguments. The uses of these techniques to illuminate the grammar and the logic of English sentences. The capacity of the English language to express logical distinctions. Exercises in analyzing the logical structure of published writings of varied style and content.

PHIL 174 Logic and the English Language II (3) Prerequisite: PHIL 173 or consent of instructor. Basic techniques of conceptual analysis and nondeductive reasoning examined against the capacity of the English language for exact expression. Exercises in critical analysis of published writings of varied style and content.

PHIL 206 Chinese Philosophy: Social and Political Thought (3) An introductory survey of Confucian philosophy and of other Chinese social and political philosophy from ancient times to the present day. The Chou Dynasty (1122-222 BC) and the many schools of thought produced during that period. The reemergence of Confucian philosophy in the Sung Dynasty (960-1279 AD) and trace developments down to the contemporary period. Contemporary thought in the context of earlier Chinese traditions. Not available for credit for students who earned credit for PHIL 207 prior to Fall 1976.

PHIL 207 Chinese Philosophy: Religious Thought (3) An introductory survey and critical examination of Taoist and Chinese Buddhist philosophical and religious ideas. The period from the rise of Taoist thought during the Chou Dynasty (C. 400 BC) to the decline of Buddhism in China (c. 1000 AD).

PHIL 209 Philosophical Issues (3) An examination of selected philosophical issues of general interest. May be repeated to a maximum of 6 hours for credit when the issues dealt with are different.

PHIL 233 Philosophy In Literature (3) Reading and philosophical criticism of fiction, poetry, and drama, dealing with issues of moral, religious, and metaphysical significance.

PHIL 236 Philosophy of Religion (3) A philosophical study of some of the main problems of religious thought: the nature of religious experience, the justification of religious belief, the conflicting claims of religion and science, and the relation between religion and morality.

PHIL 245 Political and Social Philosophy I (3) A critical examination of such classical political theories as those of Plato, Hobbes, Locke, Rousseau, Mill, Marx, and such contemporary theories as those of Hayek, Rawls, and recent Marxist thinkers. Not open to students who have credit in PHIL 345.

PHIL 250 Philosophy of Science I (3) An introduction to the main issues in the philosophy of science, giving special attention to the ways scientific developments have influenced the philosophy of science and how philosophy of science has influenced scientific progress. Case studies of selected historical episodes in which science and philosophy have interacted significantly, focusing on the physical, biological, or social sciences. Students cannot receive credit for both HIST 200 and PHIL 250.

PHIL 252 Moral Dilemmas In Science and Technology (3) The uses of philosophical analysis in thinking clearly about some of the moral dilemmas that have been created by modern science and technology, focusing on such issues as sociobiology, race and IQ, genetic engineering, techniques of behavior modification, nuclear power, experimentation with human subjects, ecology, and population control.

PHIL 308 Studies In Contemporary Philosophy (3) Prerequisite: six hours in philosophy. Problems, issues, and points of view of current interest in philosophy. May be repeated for credit when the topics dealt with are different. Repeatable to a maximum of six hours.

PHIL 310 Ancient Philosophy (3) Prerequisite: six credits in philosophy or classics. A study of the origins and development of philosophy and science in Ancient Greece, focusing on the pre-Socratics, Socrates, Plato, and Aristotle.

PHIL 320 Modern Philosophy (3) Prerequisite: six credits in philosophy. A study of major philosophical issues of the 16th, 17th, and 18th centuries through an examination of such philosophers as Descartes, Newton, Hume, and Kant.

PHIL 326 Twentieth Century Analytic Philosophy (3) Prerequisite: six credits in philosophy; PHIL 320 is recommended. A study of major issues in twentieth century analytic philosophy through an examination of such philosophers as Frege, Russell, Carnap, Moore, and Wittgenstein.

PHIL 328 Studies In the History of Philosophy (3) Prerequisite: six hours in philosophy. Problems, issues, and points of view in the history of philosophy. May be repeated for credit when the topics dealt with are different. Repeatable to a maximum of six hours.

PHIL 331 Philosophy of Art (3) Concepts central to thought about art, including the concept of the fine arts both in its historical development and in its present problematic situation.

PHIL 332 Philosophy of Beauty (3) Philosophical theories, historical and contemporary, of beauty, sublimity and other aesthetic qualities, of aesthetic experience and of aesthetic judgment.

PHIL 334 Philosophy of Music (3) The nature, meaning, and purpose of music. Analysis of the concepts of creativity, form, expression, and representation as they relate to music. Theories of music listening and of musical evaluation. Readings from philosophers, composers, critics, and psychologists.

PHIL 340 Making Decisions (3) Prerequisite: Three credits in Philosophy. An examination of various approaches to decision making in personal, professional, and public life. Conflict resolution, the logic of decision, moral aspects of decision making, and standard biases in judgment.

PHIL 342 Moral Problems in Medicine (3) Prerequisite: PHIL 100 or 140 or consent of instructor. A critical examination of the moral dimensions of decision-making in health related contexts. Readings are drawn from philosophical, medical, and other sources.

PHIL 343 Sexual Morality (3) A critical examination of practical moral issues bearing on sexual conduct, using the resources of moral and social philosophy.

PHIL 360 Philosophy of Language (3) Prerequisite: PHIL 170 or 173 or 371. An inquiry into the nature and function of language and other forms of symbolism.

PHIL 371 Symbolic Logic I (3) The formal analysis of deductive reasoning providing familiarity with techniques of formal deduction in propositional logic and quantification theory, as well as some knowledge of basic concepts of formal semantics (truth tables, models).

PHIL 373 Analytical Writing (3) Prerequisite: PHIL 170 or 173 or 371 (PHIL 173 and 174 recommended). Review of techniques of deductive and nondeductive reasoning, and of conceptual analysis. The development of a prose style for writing clearly and critically about ideas.

PHIL 399 Honors Seminar (3) Open to honors students in philosophy and, by permission of the instructor, to honors students in other departments. Research in selected topics, with group discussion. May be repeated for credit when the topics dealt with are different.

PHIL 408 Topics in Contemporary Philosophy (3) Prerequisite: PHIL 320. An intensive examination of contemporary problems and issues. Source material will be selected from recent books and articles. May be repeated for credit when the topics dealt with are different.

PHIL 412 The Philosophy of Plato (3) Prerequisite: six credits in philosophy. A critical study of selected dialogues.

PHIL 414 The Philosophy of Aristotle (3) Prerequisite: six credits in philosophy. A critical study of selected portions of Aristotle's writings.

PHIL 416 Medieval Philosophy (3) Prerequisite: six credits in philosophy. A study of philosophical thought from the fourth to the fourteenth centuries. Readings selected from Christian, Islamic, and Jewish thinkers.

PHIL 421 The Continental Rationalists (3) Prerequisite: six credits in philosophy. A critical study of selected writings of one or more of the continental rationalists.

PHIL 422 The British Empiricists (3) Prerequisite: six credits in philosophy. A critical study of selected writings on one or more of the British Empiricists.

PHIL 423 The Philosophy of Kant (3) Prerequisite six credits in philosophy. A critical study of selected portions of Kant's writings.

PHIL 425 19th Century Philosophy (3) Prerequisite six credits in philosophy. A study of philosophy in the nineteenth century through an examination of such figures as Hegel, Marx, Kierkegaard, Nietzsche, and Mill.

PHIL 428 Topics in the History of Philosophy (3) Prerequisites: PHIL 310 and 320, or consent of instructor. May be repeated for credit when the topics dealt with are different.

PHIL 431 Aesthetic Theory (3) Prerequisite: six credits in philosophy or permission of instructor. Study of the theory of the aesthetic as a mode of apprehending the world and of the theory of criticism, its conceptual tools and intellectual presuppositions.

PHIL 438 Topics in Philosophical Theology (3) Prerequisite: PHIL 236 or consent of instructor. An examination of a basic issue discussed in theological writings, with readings drawn from both classical and contemporary theologians and philosophers. May be repeated to a maximum of six credits when the topics are different.

PHIL 440 Contemporary Ethical Theory (3) Prerequisite: PHIL 142. Contemporary problems having to do with the meaning of the principal concepts of ethics and with the nature of moral reasoning.

PHIL 441 History of Ethics: Hobbes to the Present (3) Prerequisite: PHIL 140. The history of ethical thought from the seventeenth century to the present, including such philosophers as Hobbes, Butler, Hume, Kant, Bentham, Mill, Bradley, Sidgwick, Moore, and Stevenson.

PHIL 445 Political and Social Philosophy II (3) Prerequisite: PHIL 142 or 345. A study of the main issues encountered in the philosophical analysis and evaluation of social and political institutions.

PHIL 446 Law, Morality, and War (3) Prerequisite: GVPT 300 or 401 or PHIL 142 or consent of instructor. An exploration of fundamental moral and legal issues concerning war. Also offered as GVPT 403.

PHIL 447 Philosophy of Law (3) Prerequisite: one course in philosophy. Examination of fundamental concepts related to law, e.g., Legal system, law and morality, justice, legal reasoning, responsibility.

PHIL 450 Scientific Thought I (3) The development of science, its philosophical interpretations and implications, and views of its methods, from the ancients through Newton and Leibniz.

PHIL 451 Scientific Thought II (3) The development of science, its philosophical interpretations and implications, and views of its methods, from the death of Newton to the early twentieth century.

PHIL 452 Philosophy of Physics (3) Prerequisite: three credits in philosophy or three credits in physics. Implications of 20th century physics for such problems as operationalism, the structure and purpose of scientific theories, the meaning of "probability", the basis of geometrical knowledge, the nature of space and time, the Copenhagen interpretation of quantum mechanics, the nature and limits of measurement. Emphasis on the interaction between physics and philosophy.

PHIL 453 Philosophy of Science II (3) Prerequisite: PHIL 250 or an upper-level course in philosophy or a major in science. A comprehensive survey of developments in the main problems of the philosophy of science from logical positivism to the present. The nature of theories, models, laws, and counterfactuals, testing inductive logic and confirmation theory, experimental methodology, measurement, explanation, concept formation, growth of scientific knowledge, and scientific realism.

PHIL 454 Philosophy of Economics (3) Prerequisite: ECON 203 or consent of instructor. Conceptual, methodological, ethical, and ideological issues arising from or related to economic theory. Conceptual structure of economics, and logical relations among economic theories. The relations between economics and ethics, and of the importance of ideology.

PHIL 455 Philosophy of the Social Sciences (3) Prerequisites: PHIL 250 or six hours in a social science or consent of the instructor. A consideration of philolophical issues arising in the social sciences, with particular emphasis on issues of practical methodological concern to social scientists.

PHIL 456 Philosophy of Biology (3) Prerequisite: PHIL 250 or permission of the instructor. Questions about concepts, reasoning, explanation, etc., in biology, and their relations to those of other areas of science. Case studies of selected aspects of the history of biology, especially in the twentieth century.

PHIL 457 Philosophy of History (3) An examination of the nature of historical knowledge and historical explanation.

PHIL 458 Topics in the Philosophy of Science (3) Prerequisite: PHIL 250 or consent of the instructor when the topic for a given semester demands, additional philosophical or scientific prerequisites may be required by the instructor. A detailed examination of a particular topic or problem in philosophy of science. Repeatable to a maximum of six credits when the content is different.

PHIL 461 Theory of Meaning (3) Prerequisite: six credits in philosophy. Theories about the meaning of linguistic expressions, including such topics as sense and reference, intensionality and necessity, and possible-world semantics, through an examination of such writers as Mill, Frege, Wittgenstein, Quine, and Kripke.

PHIL 462 Theory of Knowledge (3) Prerequisite: six credits in philosophy. Some central topics in the theory of knowledge, such as perception, memeory, knowledge, and belief, skepticism, other minds, truth, and the problems of induction.

PHIL 464 Metaphysics (3) Prerequisite: six credits in philosophy. A study of some central metaphysical concepts such as substance, identity, relations, causality, and time, and of the nature of metaphysical thinking.

PHIL 465 Philosophy of Psychology (3) A study of epistemological, conceptual, and methodological assumptions of three major movements in 20th Century psychology: psychoanalysis, behavionsm, and cognitive psychology.

PHIL 466 Philosophy of Mind (3) Prerequisite: six credits in philosophy. An inquiry into the nature of mind through the analysis of such concepts as consciousness, thought, sensation, emotion, and desire. Consideration of mind-brain identity thesis.

PHIL 471 Symbolic Logic II (3) Prerequisite: PHIL 371 or consent of instructor. Axiomatic development of the propositional calculus and the first-order functional calculus, including the deduction theorem, independence of axioms, consistency, and completeness.

PHIL 472 Philosophy of Mathematics (3) Prerequisite: PHIL 371 or consent of instructor. A study of results in foundations of mathematics and of philosophical views of the nature of mathematics and of mathematical knowledge.

PHIL 474 Induction and Probability (3) Prerequisite: consent of instructor. A study of inferential forms, with emphasis on the logical structure underlying such inductive procedures as estimating and hypothesis-testing. Decision-theoretic rules relating to induction will be considered, as well as classic theories of probability and induction.

PHIL 478 Topics in Symbolic Logic (3) Prerequisite: PHIL 471. May be repeated for credit when the topics dealt with are different.

PHIL 498 Topical Investigations (1-3)

PHYS — Physics

PHYS 101 Contemporary Physics (3) Prerequisite: high school algebra. For non-science students who are interested in the evolution of scientific thought and its present day significance. Historical, philosophic, experimental and theoretical aspects of physics are presented. Topics in mechanics, relativity, electricity and magnetism, and nuclear physics are covered. Not open to students who have taken PHYS 111, 112.

PHYS 102 Physics of Music (3) Prerequisite: high school algebra. A study of the physical basis of sound, acoustical properties of sound, the human ear and voice, reproduction of sound, electronic music, acoustical properties of auditonums, and other selected topics. Credit not applicable towards the minimum requirements for a major in physics and astronomy.

PHYS 103 Physics of Music Laboratory (1) One two-hour laboratory per week. Pre-or co-requisite: PHYS 102. Optional laboratory to accompany PHYS 102. Laboratory experiments, including the velocity of sound, sound quality and wave shape, traveling and standing waves, fourier synthesis and analysis, musical synthesizer, psychoacoustics, and audio equipment. Credit not applicable towards the minimum requirements for a major in physics and astronomy.

PHYS 106 Light, Perception, Photography, and Visual Phenomena (3) Intended for the general student, this course will cover topics in optics which require minimal use of mathematics. Principles of optics, lenses, cameras, lasers and holography, physics of the eye, color vision and various visual phenomena such as

rainbows. Credit not applicable towards the minimum requirements for a major in physics and astronomy.

PHYS 107 Light, Perception, Photography and Visual Phenomena Laboratory (1) Pre- or co-requisite - PHYS 106. Optional laboratory to accompany PHYS 106. One two-hour laboratory session weekly. Laboratory experiments include geometrical optics (lenses, cameras, eye), optical instruments (telescope, binoculars), photography, perception, color phenomena, and wave phenomena. Credit not applicable towards the minimum requirements for a major in physics and astronomy.

PHYS 111 Physics in the Modern World (3) The first semester of a survey course in general physics emphasizing the role that physics plays in science, technology, and society today. The course is concept oriented and minimal use of mathematics is made. Intended for the general student, does not satisfy the requirements of the professional schools.

PHYS 112 Physics in the Modern World (3) The second semester of a survey course in general physics emphasizing the role that physics plays in science, technology, and society today. The course is concept oriented and minimal use of mathematics is made. Intended for the general student; does not satisfy the requirements of the professional school.

PHYS 114 Energy and the Environment (4) Three lectures and one two-hour laboratory per week. A one semester course on energy, its use and associated environmental problems. High school algebra recommended. A physical science course for students who wish an acquaintance with the methods and attitudes of physical science and their application to current problems in the generation and use of energy in our modern world. Topics include: nuclear and solar power generation, and air, water and radiation pollution.

PHYS 117 Introduction to Physics (4) Three lectures and one, two-hour laboratory per week. Prerequisite: qualification to enter MATH 110. Intended for students majoring in neither the physical nor biological sciences. A study of the development of some of the basic ideas of physical science.

PHYS 120 Physical Principles in Medical Technology (4) Three hours of lecture plus a two hour laboratory period per week. This course is designed to acquaint medical technology students with the physics they need to understand instruments and practices used in modern medicine. Energy, heat, electronics, and radiation are some topics covered. This course does not satisfy the undergraduate course requirements of future medical and dental students.

PHYS 121 Fundamentals of Physics I (4) Three lectures, one recitation, and one two-hour laboratory period a week. Prerequisite: previous course work in trigonometry or MATH 110 or MATH 115. The first part of a two-semester course in general physics treating the fields of mechanics, heat, sound, electricity, magnetism, optics, and modern physics. Together with PHYS 122, this generally satisfies the minimum requirement of medical and dental schools.

PHYS 122 Fundamentals of Physics II (4) Three lectures, one recitation, and one two-hour laboratory period per week. Prerequisite: PHYS 121 or equivalent. A continuation of PHYS 121. Which together with it, generally satisfies the minimum requirement of medical and dental schools.

PHYS 141 Principles of Physics (4) The first of a two-semester series in general physics. Three lectures, one recitation, and one two-hour laboratory per week. Concurrent enrollment in MATH 141 or equivalent. The first semester covers the fields of mechanics, thermodynamics, and special relativity. This survey course will use calculus and is recommended for chemistry and zoology majors. It also satisfies the requirements of medical and dental schools.

PHYS 142 Principles of Physics (4) A continuation of PHYS 141. The second semester covers the fields of waves, electricity and magnetism, optics, and modern physics.

PHYS 161 General Physics: Mechanics and Particle Dynamics (3) Three lectures and one recitation per week. First semester of a three-semester calculus-based general physics course. Pre- or corequisite MATH 141. Laws of motion, force, and energy; principles of mechanics, collisions, linear momentum, rotation, and gravitation.

PHYS 191 Introductory Physics: Mechanics (3) Prerequisites: a high school physics course or consent of the department. Corequisites: PHYS 195, and MATH 140 or 141. First semester of a four-semester sequence intended for physics majors or others desiring a rigorous preparation in the physical sciences: kinematics, dynamics, conservation laws, applications, kinetic theory of gases.

PHYS 192 Introductory Physics: Thermodynamics, Waves and Special Relativity (3) Prerequisites: MATH 140, PHYS 191 and 195. Corequisites: MATH 141, PHYS 196. Second semester of a four-semester sequence intended for physics majors or others desiring a rigorous preparation in the physical sciences: thermodynamics, waves, special relativity.

PHYS 195 Introductory Physics Laboratory I (1) Corequisite: PHYS 191. One three-hour laboratory biweekly alternating with two-hour demonstration discussion periods. Kinematics, dynamics, conservation laws. All reports will be done during the class period.

PHYS 196 Introductory Physics Laboratory II (1) Corequisite: PHYS 192. One three-hour laboratory biweekly alternating with two-hour demonstration-discussion periods. Simple harmonic motion, waves, sound, thermodynamics, special relativity. All reports will be done during the class period.

PHYS 221 General Physics For Science Teachers I (4) Prerequisite: a high school physics course. Pre- or corequisite: MATH 140 or 220. Three lectures, one two-hour laboratory and one recitation per week. The first part of a two-semester sequence in physics, stressing physical insight, for prospective secondary school science and mathematics teachers.

PHYS 222 General Physics for Science Teachers II (4) Prerequisite: PHYS 221. Three lectures, one two-hour laboratory and one recitation per week. A continuation of PHYS 221.

PHYS 262 General Physics: Vibrations, Waves, Heat, Electricity and Magnetism (4) Three lectures, one recitation, and one three-hour laboratory per week. Second semester of a three-semester calculus-based general physics course. Prerequisite: PHYS 161. Vibrations, waves, fluids; heat, kinetic theory, and thermodynamics, electrostatics, circuits, and magnetism. PHYS 262A is the lab for this course, and must be registered for at the same time.

PHYS 263 General Physics: Electrodynamics, Light, Relativity and Modern Physics (4) Third semester of a three-semester calculus-based general physics course. Three lectures, one recitation, and one three-hour laboratory session per week. Prerequisite: PHYS 262. Electrodynamics, Maxwell's equations, and electromagnetic waves; geometrical optics, interference and diffractions, special theory of relativity; and modern physics. PHYS 263a is the lab for this course, and must be registered for at the same time.

PHYS 293 Introductory Physics: Electricity and Magnetism (3) Prerequisites: PHYS 192, 196, MATH 141. Corequisites: PHYS 295; MATH 241 or 240. (It is preferable to take MATH 241 before MATH 240 for this course.) Third semester of a four-semester sequence intended for physics majors or others desiring a rigorous preparation in the physical sciences: phenomenological laws of electricity and magnetism Maxwell's equations, electrical and magnetic properties of matter, applications.

PHYS 294 Introductory Physics: Optics and Modern Physics (3) Prerequisites: PHYS 293, 295, MATH 241 or 240. Corequisites: PHYS 296, MATH 241 or 240. Fourth semester of a four-semester sequence intended for physics majors or others desiring a rigorous preparation in the physical sciences: electromagnetic waves, geometrical and physical optics, modern physics.

PHYS 295 Introductory Laboratory in Electricity and Magnetism (2) Corequisite: PHYS 293. One four-hour lecture-laboratory session per week. Electrostatics, magneto-statics, magnetic induction, electric and magnetic fields, AC circuits.

PHYS 296 Introductory Laboratory in Electromagnetic Waves (2) Corequisite: PHYS 294. One four-hour laboratory-lecture session per week. Electromagnetic waves, interference and diffraction, dispersion, modern physics.

PHYS 299 Special Problems in Physics (1-6) Prerequisite: consent of department. Research or special study to complement courses taken elsewhere which are not fully equivalent to those in departmental requirements. Credit according to work done. May be taken no more than twice. Maximum of eight credits applicable to B.S. degree program.

PHYS 305 Physics Shop Techniques (1) One three-hour laboratory per week. Prerequisite: PHYS 395 or consent of instructor. Machine tools, design and construction of laboratory equipment.

PHYS 318 Topics in Contemporary Physics (3) Prerequisite: PHYS 122, PHYS 112 or consent of the instructor. A survey of topics of current research and public interest. Intended for the non-physics or non-science major. Topics covered will include lasers, quantum liquids, cosmology, elementary particles and geophysics.

PHYS 389 Undergraduate Thesis Research (1-6) Prerequisite: consent of advisor. Independent directed research and study on a topic selected by the student in consultation with his advisor. Final written thesis and oral defense will be expected. Enrollment limited to undergraduate physics majors. May be repeated to a maximum of six credits.

PHYS 395 Advanced Experiments (3) Prerequisites: PHYS 294 and 296, or PHYS 263. Advanced laboratory techniques. Selected experiments from many fields of modern physics. Emphasis on self-study of the phenomena, data analysis, and presentation in report form.

PHYS 398 Independent Studies Seminar (1-16) Credit according to work done. Enrollment is limited to students admitted to the independent studies program in physics.

PHYS 399 Special Problems in Physics (1-3) Two hours laboratory work a week for each credit hour. One to three credits may be taken concurrently each semester. (Will be given with sufficient demand.) Prerequisite: PHYS 395 and consent of advisor. Selected advanced experiments.

PHYS 400 Basic Concepts of Physics I (3) Prerequisite: junior standing. A primarily descriptive course in two semesters, intended mainly for those students in the liberal arts who have not had any other course in physics. This course does not serve as a prerequisite or substitute for other physics courses. The main emphasis is on the concepts of physics, their evolution and their relation to other branches of human endeavor.

PHYS 401 Basic Concepts of Physics II (3) Prerequisite: PHYS 400 or consent of instructor.

PHYS 404 Intermediate Theoretical Mechanics (3) Prerequisites: PHYS 142 or 263, MATH 241 previously or concurrently. Fundamentals and selected advanced topics of physical mechanics. Vector differential calculus will be used.

PHYS 405 Intermediate Theoretical Electricity and Magnetism (3) Prerequisite: PHYS 142 or 263; MATH 241. Intermediate electricity and magnetism and electromagnetic waves (optics). Vector differential calculus is used throughout.

PHYS 406 Optics (3) Three lectures a week. Prerequisites: PHYS 263 or 294 and MATH 240, or consent of instructor. Geometrical optics, optical instruments, wave motion, interference and diffraction, and other phenomena in physical optics.

PHYS 407 Sound (3) Prerequisite: PHYS 122, 142 or 263. Pre- or corequisite: MATH 246. A study of the basic concepts of sound production and its applications.

PHYS 410 Elements of Theoretical Physics: Mechanics (4) Prerequisites: PHYS 294, or PHYS 404 and 405, or PHYS 263 and consent of instructor, MATH 241. Pre- or corequisite MATH 240. A study of the theoretical foundations of mechanics with extensive application of the methods. Various mathematical tools of theoretical physics.

PHYS 411 Elements of Theoretical Physics: Electricity and Magnetism (4) Prerequisite: PHYS 404 or 410, and PHYS 263 or 294 or 405, or consent of the instructor. A study of the foundations of electromagnetic theory, with extensive applications of the methods. Thorough treatment of wave properties of solutions of Maxwell's equations.

PHYS 412 Kinetic Theory of Gases (3) Prerequisites: PHYS 404 and 405 or PHYS 410 and MATH 240 or

equivalent Dynamics of gas particles, Maxwell-Boltzmann distribution, diffusion, Brownian motion, etc.

PHYS 414 Introduction to Thermodynamics and Statistical Mechanics (3) Prerequisites MATH 240, PHYS 294 or 404 or consent of the instructor. Introduction of basic concepts in thermodynamics and statistical mechanics

PHYS 420 Principles of Modern Physics (3) Prerequisites PHYS 263 or 294 or 404 and 405, MATH 241 or consent of instructor. A survey of atomic and nuclear phenoma and the main trends in modern physics. This course is appropriate for students in engineering and other physical sciences. It should not be taken in addition to PHYS 421.

PHYS 421 Introduction to Modern Physics (3) Prerequisites PHYS 294 or equivalent, MATH 241 including some knoledge of ordinary differential equations. Introductory discussion of special relativity, origin of quantum theory, Bohr atom, wave mechanics, atomic structure, and optical spectra

PHYS 422 Modern Physics (3) Prerequisite: PHYS 421. This course uses the basic ideas of quantum mechanics and special relativity to discuss the characteristics of many diverse subjects including complex atoms, molecules, solids, nuclei and elementary particles.

PHYS 423 Elementary Quantum Physics (3) Prerequisites: PHYS 420 or 422, MATH 240 and 246, and a level of mathematical sophistication equivalent to that of a student who has taken PHYS 410 and 411, or ENEE 380 and 381. A rigorous presentation the quantum theory, including the concepts of operators, measurement and angular momentum. The application of these concepts together with the Schroedinger equation to some basic problems in atomic and molecular physics.

PHYS 429 Atomic and Nuclear Physics Laboratory (3) PHYS 395 and consent of instructor. Classical experiments in atomic physics and more sophisticated experiments in current techniques in nuclear physics.

PHYS 431 Properties of Matter (3) Prerequisite: PHYS 404 or 410, and PHYS 405 or 411, and PHYS 420 or 421. Introduction to solid state physics. Electro-magnetic, thermal, and elastic properties of metals, semiconductors, insulators and superconductors.

PHYS 441 Nuclear Physics (3) Prerequisite: PHYS 404 and 405, or PHYS 410, or PHYS 420.OR PHYS 421. An introduction to nuclear physics at the pre-quantum-mechnaics level. Properties of nuclei; radioactivity; nuclear systematics, nuclear moment, the Shell model, interaction of charged particles and Gamma rays with matter, nuclear dectectors, accelerators, nuclear reactions, Beta decay, high energy phenomena.

PHYS 443 Neutron Reactor Physics (3) Prerequisite: PHYS 420 or PHYS 421 or consent of instructor. Various related topics in neutron reactor physics.

PHYS 451 Introduction to Elementary Particles (3) Prerequisite: PHYS 422 or consent of instructor. Properties of elementary particles, production and detection of particles, relativistic kinematics, invariance principles and conservation laws.

PHYS 461 Introduction to Fluid Dynamics (3) Prerequisites PHYS 404 and MATH 240. Kinematics of fluid flow, properties of incompressible fluids, complex variable methods of analysis, wave motions.

PHYS 463 Introduction to Plasma Physics (3) Three lectures a week. Prerequisites: PHYS 404 or 410, or ENES 221, and PHYS 405 or 411, or ENEE 380, or consent of instructor. Students without the electricity and magnetism prerequisite but having a familiarity with Maxwell's equations should check with the instructor. Orbit theory, magneto-hydrodynamics, plasma heating and stability waves and transport processes.

PHYS 465 Modern Optics (3) Prerequisites: PHYS 410, and 420 or 421, and 411 or consent of instructor. Designed for students with a background in fundamental optics; the course deals with topics in modern optics such as coherence, holography, principles of laser action, electron optics, and non-linear optics

PHYS 471 Introduction to Atmospheric and Space Physics (3) Prerequisite: PHYS 404 or 410, and PHYS 405 or 411, and PHYS 420 or 421. Motions of charged particles in magnetic fields; aspects of plasma physics related to cosmic rays and radiation belts; atomic phenomena in the atmosphere; thermodynamics and dynamics of the atmosphere.

PHYS 483 Biophysics and Theoretical Biology (3) Prerequisite: consent of the intructor. Designed for advanced and mature students who may have only minimal knowledge of biological processes but are well grounded in physics. Areas in bioscience where physics, biophysical chemistry and mathematical analysis fuse to provide definition for biologic statics and dynamics.

PHYS 485 Electronic Circuits (4) Three hours of lecture and two of laboratory per week. Prerequisite: PHYS 395, and concurrent enrollment in PHYS 405 or 411. Theory of semi-conductor and vacuum tube circuits. Application in experimental physics.

PHYS 487 Particle Accelerators, Physical and Engineering Principles (3) Prerequisites: PHYS 410, 411 or 271, 321 and 421, or equivalents. Sources or charged particles, methods of acceleration and focusing of electron and ion beams in electromagnetic fields, electrostatic accelerators, constant-gradient cyclotrons and synchrotrons, betatrons and microtrons, the alternating-gradient and sector-focusing principles, isochronous syclotrons and alternating-gradient sychrotrons, linear accelerators. This course is also listed as ENEE 487.

PHYS 490 History of Modern Physics (3) Prerequisite: PHYS 420 or 421 or equivalent. Primarily for senior physics majors and first year graduate students. A survey of major discoveries and trends in 20th century physics, including the relations of physics to other sciences, philosophy of science, technology and society

PHYS 499 Special Problems in Physics (1-16) Prerequisite: major in physics and consent of advisor. Research or special study. Credit according to work done.

PORT — Portuguese

PORT 101 Elementary Portuguese (4) Four recitations per week and one optional laboratory hour. Introduction to basic structures, with emphasis upon audio-lingual skills. Leads to 102.

PORT 102 Elementary Portuguese (4) Completion of basic structures with increasing emphasis upon reading skill, reinforced by discussion and composition. Four recitations per week and one optional laboratory hour.

PORT 121 Accelerated Portuguese (3) Limited to students who have reached the 300 level or equivalent in Spanish and wish to acquire a reading knowledge of Portuguese in one semester. Normally leads to PORT 221. Cannot be used to satisfy the arts and humanities language requirement

PORT 203 Intermediate Portuguese (4) Four recitations per week and one optional laboratory hour. Extensive reading, discussion and composition.

PORT 205 Intermediate Conversation (3) Prerequisite: PORT 203 or consent of instructor. Development of oral skills in Portuguese

PORT 221 Introduction to Brazilian Literature (3) Prerequisite: PORT 104. Reading of literary texts, discussion and brief written reports. Conducted in Portuguese.

PORT 399 Independent Study in Portuguese (1-3) Prerequisite: permission of instructor. Specific readings in literature under the supervision of a faculty member of the department. Repeatable to a maximum of three credits

PORT 478 Themes and Movements of Luso-Brazilian Literature in Translation (3) A study of specific themes and movements in Luso-Brazilian literature, as announced. Designed for students for whom the literatures would be inaccessible in Portuguese. Repeatable to a maximum of six credits.

PSYC — Psychology

PSYC 100 Introduction to Psychology (3) A basic introductory course intended to bring the student into contact with the major problems confronting psychology and the more important attempts at their solution

PSYC 200 Statistical Methods in Psychology (3) Prerequisite: PSYC 100 and MATH 111 or 140 or 220. A basic introduction to quantitative methods used in psychological research

PSYC 201 Intermediate Psychology (Honors) (3) Usually taken during sophomore year. Prerequisite: PSYC 100H or permission of instructor. The course content will stress the interrelations among data derived from the fields of human development, cognition, perception, measurement and social processes

PSYC 206 Developmental Biopsychology (3) Prerequisite: PSYC 100. Biological basic of behavioral development in relation to genetic, constitutional, anatomical, physiological and environmental factors. Emphasis upon both phylogenetic and ontogenetic research findings in biological psychology

PSYC 221 Social Psychology (3) Prerequisite: PSYC 100. The influence of social factors on the individual and interpersonal behavior. Includes topics such as conformity, attitude change, person perception, interpersonal attraction and group behavior.

PSYC 301 Biological Basis of Behavior (3) Prerequisite: PSYC 100. The experimental analysis of the behavior of humans and animals from the point of view of the biological mechanisms of behavior. Topics such as genetic determiners and physiological mechanisms, and basic principles of conditioning and learning

PSYC 309 Special Topics in Psychology (3) Prerequisite: PSYC 100. Topics of current interest which represent extensions of or additions to topics covered in more general topical courses. Offered on a seminar basis. Repeatable to a maximum of six credits.

PSYC 310 Perception (3) Prerequisite: PSYC 100 or consent of the instructor. A survey of phenomena and theories of perception including psychological, anatomical, physiological, and environmental factors important in determining how we perceive the world. Historical background will be examined as well as contemporary research. No credit for students who have completed PSYC 410.

PSYC 331 Introduction to Abnormal Psychology (3) Prerequisite: PSYC 100. History of the study of psychopathology and mental health, concepts and models of psychopathology, concepts and models of positive mental health, major syndromes of deviant behavior including psychoneurosis, psychosis, personality disorders, and affective disorders, theories of deviant behavior, and community mental health. A student may not receive credit for both PSYC 331 and PSYC 431

PSYC 332 Psychology of Human Sexuality (3) Prerequisite: PSYC 100. A survey of historical and contemporary psychological views on a wide variety of sexual behaviors, theory and research bearing on the relationship between life span psychological development, psychological functioning, interpersonal processes and sexual behaviors, political and social issues involved in current sexual norms and practices.

PSYC 335 Personality and Adjustment (3) Prerequisite: PSYC 100. Introduction to psychology of human personality and adjustment. This course is designed for the student who desires a general knowledge of this area of psychology. A student may not receive credit for both PSYC 335 and 435

PSYC 336 Psychology of Women (3) Prerequisite: PSYC 100. A survey of the biological life-span development, socialization, personality, mental health factors, and special problems of women.

PSYC 337 Introduction to Community Psychology (3) Prerequisites: PSYC 100. Survey and critical examination of environmental factors associated with variations in individual functioning. Effects of social process and social structure in community life on individual mental health; theoretical models in community psychology. Additional topics within community psychology

PSYC 341 Introduction to Memory and Cognition (3) Prerequisite: PSYC 100. An introduction to the basic models, methods of research and findings in memory, problem-solving and language and their applications

PSYC 355 Child Psychology (3) Prerequisite: PSCY 100. Survey of research and theory of psychological development from conception through childhood, stressing physiological, conceptual and behavioral changes and the social and biological context in which

individuals develop. Not open for credit to students who have already completed PSYC 333 or 433.

PSYC 356 Psychology of Adolescence (3) Prerequisite: PSYC 100, 355, or permission of the instructor. A description of adolescent development based on research and theory interrelating psychological, intellectual, and social changes during the teen years and the systems dealing with those changes.

PSYC 357 Psychology of Adulthood and Aging (3) Prerequisite: PSYC 100. Theory, research and implications of developmental stability and change in psysiological, intellectual and interpersonal functioning in the social context from early adulthood through the aging years.

PSYC 361 Survey of Industrial and Organizational Psychology (3) Prerequisite: PSYC 100. A general survey of the field of industrial organizational psychology including such topics as organizational entry (recruitment, selection, training, socialization), organizational psychology (motivation, leadership, job attitudes), and productivity in the work place (performance appraisal, absenteeism, turnover). The role that the larger environment plays in influencing work behaviors and work attitudes.

PSYC 400 Experimental Psychology: Learning and Motivation (4) Two lectures and four one-hour laboratory periods per week. Prerequisite: PSYC 100; and PSYC 200 or a course in statistics. Primarily for psychology majors. The experimental analysis of behavior with emphasis on conditioning, learning and motivational processes. Experiments are conducted on the behavior of animals.

PSYC 401 Advanced Laboratory in the Experimental Analysis of Behavior (3) Prerequisite: PSYC 400. An intensified extension of the principles and techniques demonstrated in the laboratory of PSYC 400. Emphasis on complex schedules of reinforcement, and experimental designs using repeated measures.

PSYC 402 Physiological Psychology (3) Prerequisite: PSYC 206 or 301. An introduction to research on the physiological basis of human behavior, including considerations of sensory phenomena, motor coordination, emotion, drives, and the neurological basis of learning.

PSYC 403 Animal Behavior (3) Prerequisite: PSYC 206 or 301. A study of animal behavior, including considerations of social interactions, learning, sensory processes, motivation, and experimental methods, with a major emphasis on mammals.

PSYC 404 Introduction to Behavioral Pharmacology (3) Prerequisite: PSYC 206 or 301 or 400 or a course in zoology. The basic findings and theoretical viewpoints on the interaction of drugs and behavior. Introduction to basic principles of pharmacology, the effects of drugs on various behavior, experimental analysis of drug dependence and abuse, and neuropharmacology and behavior.

PSYC 405 Applied Behavior Analysis (3) Prerequisite: PSYC 301. Theoretical and research literature in the application of operant and respondent conditioning principles to human behavior. Approaches to behavior problems in school, home and professional settings.

PSYC 410 Experimental Psychology: Sensory Processes I (4) Three lectures and one two-hour laboratory/demonstration period per week. Prerequisite: MATH 140, or 111 and 220. Primarily for students who major in psychology. A systematic survey of the content, models, and methodologies of sensory and perceptual research. A student who has completed PSYC 310 must have permission of the instructor in order to register for PSYC 410.

PSYC 412 Experimental Psychology: Sensory Processes II (4) Two lectures and four hours of laboratory exercise and research per week. Prerequisite: PSYC 410 or consent of instructor. Primarily for psychology majors and majors in biological sciences with a special interest in sensory processes. Lectures and laboratory exercises will emphasize contemporary problems in sensory process research. Sufficient latitude will be provided so the exceptional student may conduct original research based on findings reported in the current literature.

PSYC 415 History of Psychology (3) Prerequisite: twelve credits in psychology or permission of the instructor. The origins of psychology in philosophy and biology, and the development of psychology as a science in the nineteenth and twentieth centuries. Consideration of current theoretical perspectives and experiments in relation to the enduring problems of psychology and of the role of culture, science, and technology in the development of psychological ideas.

PSYC 420 Experimental Psychology: Social Processes I (4) Prerequisite: PSYC 200 and 221. Primarily for psychology majors. A laboratory course which provides a basic understanding of experimental method in social psychology and experience in conducting research on social processes.

PSYC 421 Experimental Psychology: Social Processes II (4) Prerequisite: PSYC 420. Two hours of lecture and four hours of laboratory per week. An advanced laboratory course which provides intensive training in experimental work in social psychology and the opportunity to design and carry out original research on social processes.

PSYC 423 Advanced Social Psychology (3) Prerequisite: PSYC 420 or permission of the instructor. A systematic review of research and points of view in regard to major problems in the field of social psychology.

PSYC 424 Communication and Persuasion (3) Prerequisite: PSYC 221 or equivalent. The effect of social communication upon behavior and attitudes. Theory and research concerning attitude change and social influence.

PSYC 431 Abnormal Psychology (3) Prerequisite: PSYC 100. The nature, diagnosis, etiology, and treatment of mental disorders. A student may not receive credit for both PSYC 331 and 431.

PSYC 435 Personality (3) Prerequisite: PSYC 100. Major personality theories, their postulates and evidence, assessment and research methodology in personality, major areas of personality research, their methodologies, findings, implications, and relationships to the field of psychology. A student may not receive credit for both PSYC 335 and 435.

PSYC 436 Introduction to Clinical Psychology (3) Prerequisites: PSYC 100. A survey and critical analysis of clinical psychology, with particular emphasis on current developments and trends. Students will be expected to conduct individual projects with a substantial amount of direct supervision.

PSYC 440 Experimental Psychology: Cognitive Processes (4) Three lectures and one two-hour laboratory per week. Prerequisite: PSYC 200 or equivalent. A laboratory course which provides a systematic survey of the content, models, and methods in cognitive psychology with an emphasis on auditory and visual pattern recognition, information processing, attention, memory, learning, problem solving, and language.

PSYC 442 Psychology of Language (3) Prerequisite: PSYC 100, 200 and either 341 or 440 or consent of the instructor. Introductory survey of topics in psycholinguistic research, theory and methodology. Major emphasis on the contribution of linguistic theory to the psychological study of language behavior and cognition. Linguistic theory, biological bases of language, and speech, grammars, phonetics and phonological performance, speech perception and production, psychological studies of syntax and semantics, language and cognitive development, language comprehension and thought, etc.

PSYC 443 Thinking and Problem Solving (3) Prerequisites: PSYC 100, 200 and either 341 or 440 or consent of the instructor. Survey of topics in the psychology of thinking and problem solving. The historical development, current theory and data, and research methods in problem solving. Formal problem solving theory and computer models of thinking and human problem behavior. The uses of strategies to improve students' own thinking processes and problem solving behavior.

PSYC 444 Cognitive Structure In Perception (3) Prerequisites: PSYC 100, and 200 and either 341 or 440 or consent of the instructor. Perception as an information extraction and pattern recognition process. Complex form and space perception and pattern recognition of speech. Review of early studies of form and pattern perception which support information processing state or cascade models of perceptual capacities; studies on development and the roles of learning and attention.

PSYC 451 Principles of Psychological Testing (4) Three lectures and one two-hour laboratory period per week. Prerequisite: PSYC 200 or equivalent. A survey of the basic concepts and theories of psychological measurement illustrated through demonstration of principal approaches to psychological testing.

PSYC 452 Psychology of Individual Differences (3) Prerequisite: PSYC 200. Problems, theories, and researches related to psychological differences among individuals and groups.

PSYC 453 Mathematical Psychology (3) Prerequisite: PSYC 200 or equivalent, and consent of instructor. A survey of mathematical formulations in psychology, including measurement and scaling models, statistical and psychometric models, and elementary mathematical representations of psychological processes in learning, choice, psychophysics, and social behavior.

PSYC 456 Research Methods In Developmental Psychology (3) Prerequisites: PSYC 200 and either 355, 356, or 357. A presentation of major research designs used in developmental psychology and of the methodology used in developmental research, such as observational research, program evaluation and laboratory experimentation.

PSYC 457 Cultural Context of Psychological Development (3) Prerequisites: PSYC 100, and either 355, 356 or 357, or permission of instructor. An examination of whether important differences or similarities exist among and within cultures in the way people develop psychological competencies in the period from birth through adolescence.

PSYC 458 Applied Developmental Psychology (3) Prerequisite: PSYC 100 and either 355, 356 or 357. An examination of a topic in developmental psychology which has been examined in the laboratory and is central to developmental theories. Extension of these analyses to practical and social issues in the daily life of the developing individual. Topics will vary from semester to semester. Repeatable up to a maximum of six credits.

PSYC 460 Psychological Foundations of Personnel Selection and Training (3) Prerequisite: PSYC 200 or equivalent. An examination of issues and processes involved in the design and evaluation of personnel selection and training programs in a variety of organizational settings: job, person and organizational analysis; organizational choice, development of predictors; evaluation of instructional and training systems, criteria for performance evaluation, promotion and training.

PSYC 462 Engineering Psychology and Training Models (3) Prerequisite: PSYC 200 or equivalent, and one other 200 level course. For majors. An examination of the theories and research regarding human performance capabilities and skills (information processing, decision-making, environmental constraints, automation), training procedures (traditional methods, programmed learning, computer-assisted instruction) and models and procedures for evaluating training programs in industry, education, and service organizations.

PSYC 463 Psychology of Motivation and Attitudes In Organizational Settings (3) Prerequisite: PSYC 361 or equivalent. Theories, research and practice regarding the assessment, understaning, and prediction of motivation at work. Theories of, and the assessment and consequences of, various work-related attitudes. An intergration of theory, research and practice.

PSYC 464 Psychology of Leaders In Work Organizations (3) Prerequisite: PSYC 361 or equivalent. The psychological assumptions and implications of various theories of management and leadership. Selections and training development of careers; influence processes: change of managerial behavior,and the impact of the larger environment, nature of product or service, and organization structure on managerial behavior.

PSYC 465 Psychology of Organizational Processes (3) Prerequisite: PSYC 361 or equivalent. Various theories of interpersonal, intra- and inter-group relations, with emphasis on issues of conflict, competition, cooperation and the role of power in organizations. Organizational diagnosis and intervention.

PSYC 466 Environmental and Ecological Psychology (3) Prerequisite: PSYC 200 or equivalent. An examination

of measurement, description, and impact of the physical and social environments which affect various aspects of behavior in school, at work, and during leisure.

PSYC 467 Vocational Psychology (3) Survey and critical analysis of theory and research on vocational choice and vocational adjustment. Definition and correlates of vocational aspirations, preferences, choices, motivation, success, and satisfaction. Developmental trends in career decision-making and career patterns.

PSYC 468 Field Experience and Special Assignments in Honors (1-3) Prerequisite: Supervisor and honors faculty approval. An individual experience arranged by the honors student and his or her supervisor. A proposal submitted to the honors faculty in the semester preceding registration for the course should state the activities anticipated and the method of evaluation.

PSYC 469 Honors Thesis Proposal Preparation (1-3) Prerequisite: Honors thesis supervisor's approval. Development of honors thesis proposal by preliminary research and literature review. Presentation of formal proposal to the thesis committee. Repeatable to a maximum of 3 credits.

PSYC 470 Comprehensive Review For Honors Students (3) Prerequisite: Honors faculty approval. This course provides students with senior review guided by the honors faculty for preparation and completion of the honors examination.

PSYC 478 Independent Study in Psychology (1-3) Prerequisite: written consent of the instructor in the form of a study agreement jointly signed by the students and faculty mentor. The students must have completed 9 hours in Psychology with at least a 3.0 average in Psychology and a 2.8 overall G.P.A. Integrated reading under direction leading to the preparation of an adequately documented report on a special topic.

PSYC 479 Special Research Problems in Psychology (1-3) Prerequisite: written consent of instructor. A student who wishes to take independent research study must have completed 12 houur of psychology with at least a 2.5 average. An individual course designed to allow the student to pursue a specialized research topic under supervision. (In special cases a student who may need to repeat this course in order to complete his research will make a formal request, including a research proposal, through his advisor to the departmental honors committee.)

PSYC 488 Advanced Psychology I (Honors) (3) Usually taken during junior year. Prerequisites: PSYC 200 and permission of department honors committee. Seminar covering topics in sensation, perception, learning and motivation.

PSYC 489 Senior Seminar (3)

PSYC 498 Advanced Psychology II (Honors) (3) Usually taken during senior year. Prerequisite: PSYC 488H. Semester covering topics in measurement, social processes and other subject matter of current interest.

PSYC 499 Honors Thesis Research (3) Usually taken during last semester in residence. Prerequisite: permission of thesis advisor.

RECR — Recreation

RECR 130 Recreation and Leisure (3) The study of recreation and leisure behavior, including concepts, theories and terminology. Psychological, social psychological and sociological factors that affect recreation and leisure behavior throughout the lifespan. Analysis of recreation and leisure behavior in our changing society.

RECR 150 Camp Counseling (2) A study of the philosophy and techniques of camp counseling including the qualifications, responsibilities and skills involved, the basic organization, administration and program planning practices and problems of camping as a whole, the relationship of these practices and problems to the counselor and his or her probable success. Outdoor skills will be taught and practiced insofar as possible with field trips included.

RECR 200 Sophomore Seminar (1) Prerequisite: Consent of the department. Discussion, observation, analysis and assessment of a number of possible placements under various jurisdictions, with a number of age groupings, in different settings, with diverse facilities and programs for their activity leadership role in sophomore summer field work practicum. Work in the field with supervisors to identify strategies and problems and to develop materials appropriate to the interviewing and placement process.

RECR 220 Methods and Materials in Recreation (3) Two lectures and four hours of laboratory per week. Roles, duties and responsibilities of the recreation activity leader. Practical experience in planning, organizing, leading, participating and evaluating a wide variety of recreation activities.

RECR 270 Leisure Services and Special Populations (3) Leisure services programming for special populations (physically disabled, mentally retarded, visually impaired, hearing impaired, law offenders, psychologically disabled, and aged). Emphasis on integration of special populations into the mainstream of leisure services, including history, legislation and population characteristics.

RECR 271 Implications of Disabling Conditions For Therapeutic Recreation (3) Etiology, symptomatology and characteristics of disabling conditions and their implications for therapeutic recreation interventions in clinical and non-clinical settings. Orientation to health-related disciplines and appropriate terminology.

RECR 300 Senior Seminar (1) Prerequisite: Consent of department. Review and evaluation of academic and other professional preparation, analysis of future plans, and final preparation for entry into the recreation profession.

RECR 325 General Fundamentals of Recreation (3) This course is designed for and limited to students not majoring in recreation who wish to develop some understanding of the place, importance and potentialities of recreation in modern life. Included will be limited study of the areas of philosophy, program planning, leadership techniques, organization and administration, and interrelationships with other fields.

RECR 335 Recreation and Leisure (3) Introduction to the study of leisure or park and recreation services. The challenges, opportunities, and problems of leisure as it affects individuals' lives and the social fabric of their local, national and world communities.

RECR 340 Field Work I (6) Prerequisite: RECR 200 and consent of the department. Practical field experience in developing recreation activity leadership skills at an organized recreation department or agency. Students will be expected to make a commitment for a minimum of eight weeks or equivalent.

RECR 341 Field Work II (6) Prerequisite: RECR 300 and consent of the department. Observation and field work placement selected and assigned on the basis of the student's interest and future employment plans. Leadership activity and participation in staff activities and responsibilities.

RECR 350 Recreational Use of Natural Areas (3) An introductory orientation to the outdoor recreation phenomenon. Factors stimulating outdoor recreation involvement, federal, state, local, public, and private departments and agencies managing outdoor recreation areas, legislation; philosophical concepts, planning and management issues.

RECR 351 Nature Interpretation (3) Principles and techniques used for interpretation of environmental, natural, historic and other features of recreation and parks facilities to the visitor. Individual and group field trips will be required.

RECR 375 Principles of Therapeutic Recreation (3) Prerequisite: RECR 270. History, philosophy, and current principles of therapeutic recreation processes and application.

RECR 376 Case Study Laboratory (1) Prerequisite or corequisite: RECR 375. An applied experience where students develop and carry out an individualized intervention plan in an approved therapeutic recreation setting. Consists of one hour class per week in addition to weekly work in the therapeutic recreation setting.

RECR 389 Topical Investigations (1-3) Independent study by an individual student or a group of students in special areas of knowledge not covered by regularly scheduled courses. Repeatable to a maximum of six credits.

RECR 410 Measurement and Evaluation in Recreation (3) Prerequisite: RECR 130 or 325 or consent of instructor. A survey course in measurement tools and methods and application of measurement to evaluative processes applicable in specific and broad areas of interest and specialization in recreation and parks.

RECR 415 Quantitative Methods (3) A course covering the statistical techniques most frequently used in research pertaining to recreation. An effort will be made to provide the student with the necessary skills, and to acquaint him with the interpretations and practical applications of these techniques.

RECR 420 Program Planning and Analysis (3) Prerequisite: RECR 130 or 325. RECR 220 recommended. The essential elements and basic principles involved in the organization and administration of various types of recreation programs with emphasis on the development of practical, comprehensive program plans and evaluations for a population and a facility within the student's particular area of interest.

RECR 421 Campus Leisure Services Programming (3) An introduction to the various elements of campus leisure services program development. Intramurals, clubs and organizations as well as an analysis of the campus union as a key in the college/university community activity effort.

RECR 426 Industrial Employee Recreation (3) An introductory study of the philosophy of and practices and problems in industrial recreation. Where possible the course will include opportunities for observation and for meeting visiting specialists.

RECR 432 Philosophy of Recreation (3) A study of the meanings, relationships, and services of recreation as expressed by past and present authorities and leaders. This course should be of interest to people active in education, social work, and related fields.

RECR 440 Leisure Services for the Aging (3) Prerequisite: RECR 130 or related course. Theory and practice in program development of services for the aging. Emphasis on: (1) needs assessment theory and practice, (2) program development, (3) evaluation theory and practice; (4) leisure service settings for the aging, and, (5) issues confronting providers of services to the aging population.

RECR 450 Camp Management (3) Prerequisite: RECR 150 or experience. An advanced camping course for those students with previous training and experience; organization, administration, programming, current trends, evaluation, and special problems. Whenever possible, visiting specialists and field trips will be included.

RECR 454 Outdoor Education (6) Field experience and resident camping in an outdoor setting will be used to present the activities and techniques recommended for modern outdoor education practice. Where possible groups of participants will be utilized as subjects for practice instructional work. Activity will emphasize not only the subject matter of science and education but also the broad concepts of conservation, worthy use of leisure time, education for democratic living, etc.

RECR 455 Historical and Natural Interpretation (3) Prerequisite: RECR 351. Examination of the philosophies of and techniques appropriate to historical and natural interpretation. Analysis and development of interpretive programs and visitor information services. Field trips and laboratory experiences will be required.

RECR 457 Concepts and Issues in Outdoor Recreation (3) A survey of the relationships between land, leisure and people as increasingly vital and interdependent issues in American civilization. The mainstream of thoughts, methods and policies of resource based recreation, with special attention to the history of conservation and the significance of wilderness.

RECR 460 Leadership Techniques and Practices (3) Prerequisite: RECR 130 or 325. Various types and dynamics of recreation leadership at academic, agency, small and large group levels. Acquisition of tangible techniques, such as goal setting, decision making and leadership for purposes of organizing, implementing, observing and analyzing human function in organizational settings.

RECR 463 Supervisory Techniques in Recreation (3) A study of the principles, methods, techniques as well as an analysis of the functions of supervision in the recreation and parks environment. This course is designed to advance the student's understanding of the art of building human relationships, and to apply the

emerging concepts and principles of modern supervision to practical situations in which administrators, supervisors, leaders (both professional and paraprofessional) and volunteers are working.

RECR 475 Problems in Therapeutic Recreation (3) Prerequisite: RECR 375. Problems encountered in the delivery of therapeutic recreation services to individuals with special problems. Current trends, innovative service delivery models, literature review, and identification of funding sources.

RECR 476 Institutional Recreation (3) An introductory study of the philosophy of and practices in hospital and institutional recreation. Where possible the course will include opportunities for observation and for meeting visiting specialists.

RECR 489 Field Laboratory Projects and Workshop (1-6) A course designed to meet the needs of persons in the field with respect to workshops and research projects in special areas of knowledge not covered by regularly structured courses.

RECR 490 Organization and Administration of Recreation (3) A study of the organizational patterns and administrative problems involved in the various types of operating recreation departments and agencies; forms of organization, finance and budget; personnel; public relations.

RECR 493 Tourism and Commercial Leisure Services (3) A study of the tourism and commercial leisure services industries. Skill in feasibility study and management. Representative types of tourism and leisure services enterprises and their relationships to the public sector.

RECR 495 Recreation Resource and Facility Planning I (3) Basic principles of planning, design, development, and maintenance of community recreation areas and facilities. The interrelationships between local, regional, state, and national park and recreation systems.

RECR 497 Recreation Resource and Facility Planning II (3) Prerequisite: RECR 495 or consent of instructor. Principles of design, development, procedures, and maintenance considerations for recreation areas and facilities. Use of analytical methods to carry out park designs and development of skills in graphically conveying design concepts. Safety, efficiency and economy as they affect design, development and park maintenance.

RECR 498 Special Topics in Recreation (3) Prerequisite: Consent to instructor. Topics of special interest in areas not covered by regularly scheduled courses. Repeatable when the subject matter is different.

RLST — Religious Studies

RLST 125 Introduction to Religion (3) An introduction to Judaism, Christianity, and the religions of Asia, consideration of modern theories of religion including critics (e.g. Freud, Marx) and reinterpretation (e.g. Tillich, Bonhoeffer), some attention to recent religious movements in the west such as Yoga, Pentecostalism, Zen, and the Jesus movement.

RLST 200 Modern Religious Thought (3) Major modern religious thinkers and intellectual movements in Europe and America from 1900 to the present. Study of Protestant, Catholic and Jewish writings, representing liberalism and modernism, fundamentalism, neoorthodoxy, Vatican II, and the "Death of God" theology. Readings include Tillich, Barth, Niebuhr, Bonhoeffer, Buber, Heschel, Rubenstein, and Teilhard.

RLST 233 History of Jewish Thought I (3) An exploration of the development of classical and Rabbinic Jewish covenantal prophecy, apocalyptic development of legalism in Hebrew scriptures, early mysticism, covenantal demands in Rabbinical thought pietist attitudes and philosophy in the Middle Ages. Social factors and their intellectual repercussions—for example, Karaites and the crusades.

RLST 234 History of Jewish Thought II (3) The impact of historical events on Jewish thought from the 1492 Spanish expulsion to the present - false Messianism, emancipation, Hasidism, varieties of orthodoxy and reforms since development in America.

RTVF — Radio Television and Film

RTVF 124 Mass Communication in 20Th Century Society (3) The evolution of mass communications and the impact of the media on contemporary society. Emphasis on broadcasting and film treatments of social, economic, or political issues.

RTVF 222 Introduction to Radio, Television, and Film (3) The development, scope and influence of radio, television, and film, emphasis on the relationship of the industries to audiences, advertisers, and government.

RTVF 223 The Television Program: Planning and Management (3) Prerequisite: RTVF 222. Study of basic program formats and variations with special emphasis on pre-production planning, production organization, management, facility utilization and cost analysis.

RTVF Upper-level Course Prerequisites: RTVF 222 and RTVF 223 are prerequisites for all majors prior to enrollment in upper-level courses. Non-majors are required to obtain instructor's consent for all upper-level courses. All students are limited to one production course per semester unless permission is obtained prior to registration.

RTVF 302 Beginning Sound Production (3) Prerequisite: RTVF 223. Practical experience in sound production, including scripting, acoustics planning, recording, editing, and coordination of personnel. Application principally toward radio.

RTVF 314 Introduction to the Film (3) An elementary survey of the film as an art form. Included are: the medium of the cinema, a brief survey of its development, film genres, esthetics, criticism, and the current international scene. A series of significant American and foreign films are viewed.

RTVF 317 Radio and Television Continuity Writing (3) Prerequisites: RTVF 223 and ENGL 391 or exemption from the latter. Principles, methods and limitations of writings for radio and television. Application toward writing of general types of continuities and commercials.

RTVF 332 Public Broadcasting (3) Public television and radio: development, problems, influence, its place in contemporary broadcasting, through the viewing of and listening to selected programs.

RTVF 333 Television and Children (3) Prerequisites: RTVF 223 or consent of the instructor. A study of programming designed for children. Investigation of current research and the analysis of specific programs. Field studies with local children.

RTVF 340 Principles of Television Production Techniques (3) Prerequisite: RTVF 223 and consent of the instructor. Theory, methods techniques and problems of television production; television cameras and lenses, lighting theory and practices, audio, graphic arts and special effects. Practical application in television studios.

RTVF 346 Television News and Public Affairs (3) Prerequisite: RTVF 317 or JOUR 360. Development of broadcast journalism, current problems concerning radio and television news, and the development of the documentary.

RTVF 347 Broadcast Processes and Effects (3) Prerequisite: RTVF 223. Common analytic approaches to methods of broadcasting and their effects on society; opinion change, principles of mass persuasion, social consequences of broadcasting.

RTVF 351 Television Programming (3) Prerequisite: RTVF 223. Introduction to the history, types, theories, regulations, and conventions of television programming. Exploration of the roles of programmers, advertisers, ratings services, producers, and regulatory bodies through a programming simulation.

RTVF 355 Film Production (3) Prerequisite: consent of instructor. A study of the theoretical and practical aspects of 16mm film production. Through reading and practice, students are familiarized with basic cinematography, lighting, editing, pictorial composition, and film continuity as a communication arts medium.

RTVF 356 Film Production I, Introduction (3) Prerequisites: for majors, RTVF 222 and consent of instructor; for non-majors, consent of the instructor. Introduction to film technology and techniques.

RTVF 357 Film Production II, Cinematography (3) Prerequisites: RTVF 356 and consent of instructor. Development of proficiency in 16mm film production.

RTVF 384 Field Work Experience (1-3) Supervised, professional field work experience in business, industry, government or education. Enrollment is by permission of the department and is limited to majors.

RTVF 385 Field Work Analysis (1-3) A seminar and/or a written critique of the field work experience is required. Enrollment is by permission of the department and is limited to majors.

RTVF 402 Advanced Sound Production (3) Prerequisite: RTVF 302 and consent of instructor. An advanced sound production methodology in radio drama and documentaries.

RTVF 413 The History of the Film (3) An advanced survey of the film as an art form. Cinema pre-history, actualities and the Lumiere tradition, Melies, Griffith, and their contemporaries, the silent film (1920-29) Germany, Russia, and the U.S.A., screen comedy, the sound film (1926-present). American and foreign master directors, recent and current trends. Recommended prior to this course: RTVF 314.

RTVF 414 Contemporary American Cinema (3) Prerequisite: RTVF 222. An analysis of the trends and major social issues in American culture as they are expressed through the film medium. Emphasis on "new wave", experimental, underground, independent, and cinema verite motion pictures.

RTVF 415 Contemporary European Cinema (3) A comparative and critical analysis of the European motion picture both as a distinct art form reflecting the national character of a particular country and as a medium for mass communications demonstrating the universality of the human condition.

RTVF 417 Dramatic Writing For Broadcasting and Film (3) Prerequisite: RTVF 317 or consent of instructor. An introduction to the principles, methods and limitations of writing comedy, drama, and the documentary for radio, television, and film.

RTVF 418 The Film Auteur (3) The intensive chronological study of the work of one European or American film director each semester.

RTVF 419 Film Genres (3) The study of one major film genre each semester (the gangster film, the western, science fiction and horror, the political film). Cinema develops formal and thematic conventions and how, as a medium for reflecting social ideals and needs. Repeatable to a maximum of six credits.

RTVF 420 The Documentary Film (3) Growth, implication, and the use of the international nonfiction film as propaganda, public service, promotion, education, and entertainment. Case studies from representative documentaries will be analyzed.

RTVF 421 Film Criticism and Theory (3) Critical-aesthetic approaches to film in order to develop a vocabulary for film analysis. Included will be shot analysis; montage and deep focus; the Auteur theory; the role of screenwriter, director of photography, actor; genre analysis; analysis of film as popular art.

RTVF 424 The Film Industry: History and Technology (3) The history, status and present functions of the American film industry including the studio system, the innovation of color and sound, distribution and exhibition.

RTVF 425 Television and Politics (3) Critical review of studies of the effects of political broadcasts; legal and social issues; surveys and media campaigns.

RTVF 440 Television Direction (3) Prerequisites: RTVF 340 and consent of instructor. Principles of television direction including elements of composition, picturization, timing, script notation and program coordination.

RTVF 441 Television Direction II (3) Prerequisite: RTVF 440 or consent of instructor. Advanced theories of television direction; script analysis and adaptation, production coordination, casting, blocking, rehearsals and mixing.

RTVF 447 Quantitative Methods of Broadcast Research (3) Prerequisite: RTVF 347 or the consent of instructor. An examination of the fundamentals of survey research methodology as it relates to the study and analysis of broadcast audiences.

RTVF 449 Television Workshop (1-3) Prerequisite: Consent of instructor. Special studio projects. Repeatable to a maximum of six credits.

RTVF 450 Radio and Television Station Management (3) The role of the manager in the modern broadcasting industry. Station communication factors, regulation, licensing, personnel functions, sales, programming supervision, audience analysis, and station promotion.

RTVF 451 Broadcast Criticism (3) An analysis of the professional, historical, social, and psychological criticism of American radio and television, together with practical application of professional and scholarly critical methods.

RTVF 452 International and Comparative Broadcasting Systems (3) A comparative study of international broadcasting program policies, economic systems, control and organization. The use of broadcasting in international affairs as an instrument of propaganda, culture and information dissemination. Monitoring of overseas broadcasts, television programs and discussions with representatives of domestic and foreign international broadcast agencies.

RTVF 453 Broadcast Regulation (3) Prerequisite: RTVF 223. Legal issues involving radio and television: freedom, restraints, self-regulation, regulation of programming, competition, rights as seen by the broadcaster, regulatory agencies and the public.

RTVF 454 Cable Television (3) Prerequisite: RTVF 223. History, regulatory development, system designs, communications capability and franchising of cable television.

RTVF 456 Structure and Criticism of TV Advertising (3) Prerequisites: RTVF 222, RTVF 223 and RTVF 317. An examination of the persuasive power of television advertising. Analysis of form, structure and content of the television commercial and techniques used to influence attitudes and behavior.

RTVF 457 Media Economics (3) Economic issues involving radio, television, film, and new technologies of cable and satellite transmission.

RTVF 466 Film Production III, Synchronized Sound Film Systems (3) Prerequisites: RTVF 355 and consent of instructor. Synchronized sound and color technology with emphasis on the 16mm format.

RTVF 467 Film Production IV, Advanced (3) Prerequisites: RTVF 464 and consent of instructor. Direction and production of 16mm, color, synchronized sound motion picture. Production management, cinematography, and sound recording.

RTVF 498 Seminar (3) Prerequisites: senior standing and consent of instructor. Present day radio-television-film research. Repeatable to a maximum of six credits.

SLAV — Slavic

SLAV 001 Elementary Russian for Graduate Students (3) Intensive elementary course in the Russian Language designed particularly for graduate students who wish to acquire reading knowledge. This course does not carry credit towards any degree at the university.

SLAV 101 Elementary Russian I (4) Elements of grammar, pronunciation and conversation, exercises in translation. Readings concern the current lifestyle and civilization of the Russian-speaking world.

SLAV 102 Elementary Russian II (4) Prerequisite: SLAV 101 or the equivalent. A continuation of Slav 101.

SLAV 104 Intermediate Russian (4) Prerequisite: SLAV 102 or equivalent. Grammar review and greater mastery of vocabulary, idioms, conversational fluency and compositional skills. Readings stress the current lifestyle and civilization of the Russian-speaking world.

SLAV 122 Intensive Intermediate Russian (6) Prerequisite: SLAV 112, 121 or equivalent. Eight hours per week, including two drill hours. Reading of texts designed to give some knowledge of Russian life, thought, and culture.

SLAV 124 Elementary Russian Conversation (3) Prerequisite: SLAV 112 or equivalent. Contemporary colloquial Russian with emphasis on common idiomatic expressions and proper "speech etiquette."

SLAV 201 Russian Conversation and Composition I (3) Prerequisite: SLAV 115 or equivalent. A practical language course recommended for all students continuing in Russian.

SLAV 202 Russian Conversation and Composition II (3) Prerequisite: SLAV 201 or equivalent. A continuation of SLAV 201.

SLAV 210 Applied Russian Phonetics (3) Prerequisite: SLAV 111 or equivalent. Pronunciation: the sounds and intonational patterns of Russian in contrast with those of English. Not open to native speakers of Russian.

SLAV 268 Slavic Cultures (3) Presentation of a Slavic culture other than Russian, or a comparative contrastive view of significant features throughout the Slavic world. Readings and instruction in English. Repeatable to a maximum of six credits if content differs.

SLAV 281 Russian Culture (3) A study of Russian nationalism, artistic and social concepts in the development of Russian art, dance, geography, history and literature from the 18th to the 20th centuries. Taught in English.

SLAV 301 Advanced Russian Grammar and Composition I (3) Prerequisite: SLAV 115 or equivalent. A thorough training in the structure of the language, drill in Russian composition.

SLAV 302 Advanced Russian Grammar and Composition II (3) Prerequisite: SLAV 301. A continuation of SLAV 301.

SLAV 321 Survey of Russian Literature I (3) Prerequisite: SLAV 104 or equivalent. The first half of a survey of Russian literature.

SLAV 322 Survey of Russian Literature II (3) Prerequisite: SLAV 104 or equivalent. The second half of a survey of Russian literature.

SLAV 328 19th Century Russian Literature in Translation (3) Development of Russian literary thought in the Russian novel and short prose of the 19th century. Influence of western literatures and philosophies. Repeatable to a maximum of six credits when content differs.

SLAV 329 Soviet Literature in Translation (3) Russian literature since 1917, both as a continuation of prerevolutionary traditions and as a reflection of Soviet ideology. Repeatable to a maximum of six credits when content differs.

SLAV 369 Slavic Literature in Translation (3) A survey of the major works of the literature of the south, west and east Slavs (Yugoslav and Bulgarian, Polish and Czech, Russian primarily) on a comparative basis. Repeatable to a maximum of six credits if content differs.

SLAV 381 Russian Civilization (in Russian) I (3) Prerequisite: SLAV 115. An historical survey of Russian civilization, emphasizing architecture, painting, sculpture, music, ballet and the theater to the beginning of the 19th century, pointing out the inter-relationship of all with literary movements. Taught in Russian.

SLAV 382 Russian Civilization (in Russian) II (3) Prerequisite: SLAV 115. An historical survey of Russian civilization emphasizing architecture, painting, sculpture, music, ballet, and the theater from the beginning of the 19th century to the present, pointing out the inter-relationships of all with literary movements. Taught in Russian.

SLAV 397 Honors Seminar (3) Prerequisite: permission of honors committee chairman. Discussion of a central theme with related investigations by students. Conducted in Russian.

SLAV 398 Honors Reading Course (3) Prerequisite: SLAV 321 and 322, or permission of instructor, or honors committee chairman. Supervised reading and independent study taken normally by students admitted into the honors program. Conducted in Russian. Repeatable to a maximum of 9 credits.

SLAV 401 Advanced Russian Conversation I (3) Prerequisite: SLAV 202. For students who wish to develop fluency and confidence in speaking the language.

SLAV 402 Advanced Russian Conversation II (3) Prerequisite: SLAV 401. A continuation of SLAV 401.

SLAV 403 Advanced Russian Composition I (3) Prerequisite: SLAV 202.

SLAV 404 Advanced Russian Composition II (3) Prerequisite: SLAV 403. A continuation of SLAV 403.

SLAV 410 Applied Russian Linguistics (3) The nature of applied linguistics and its contributions to the effective teaching of foreign languages. Comparative study of English and Russian, with emphasis upon points of divergence. Analysis, evaluation and construction of related drills.

SLAV 419 Selected Topics in Russian Language Study (3) Prerequisite: permission of the instructor. Presentation of a topic in Russian language study. Repeatable to a maximum of six credits if content differs.

SLAV 423 Russian Literature of the 18th Century (3)

SLAV 431 Russian Literature of the 19th Century I (3)

SLAV 432 Russian Literature of the 19th Century II (3)

SLAV 433 Russian Literature of the 20th Century (3)

SLAV 434 Soviet Russian Literature (3)

SLAV 439 Selected Topics in Russian Literature (3) Prerequisite: permission of instructor. Presentation of a topic in Russian literature. Repeatable to a maximum of six credits if content differs.

SLAV 468 19th Century Russian Literature in Translation (3) Development of Russian literary thought in the Russian novel and short prose of the 19th century. Influence of western literatures and philosophies considered. Repeatable to a maximum of six credits when content differs.

SLAV 469 Selected Topics in Slavic Studies (3) Prerequisite: permission of instructor. Presentation of a topic in Slavic studies. Repeatable to a maximum of six credits if content differs.

SLAV 472 Comparative Slavic Linguistics (3) Prerequisite: GERM 471 or equivalent. Comparative Slavic linguistics and, especially a concept of the place of the Russian language in the world of Slavic culture through the reading of selected texts illustrating common Slavic relationships and dissimilarities.

SLAV 475 Old Church Slavonic (3) Introduction to the language of the oldest recorded Slavic documents. Historical presentation of phonology, morphology, and syntax, reading of texts.

SLAV 479 Selected Topics in Slavic Linguistics (3) Prerequisite: permission of instructor. Presentation of a topic in Slavic linguistics. Repeatable to a maximum of six credits if content differs.

SLAV 489 Selected Topics in Slavic Area Studies (3) Prerequisite: permission of instructor. Presentation of a topic in Slavic area studies. Repeatable to a maximum of six credits if content differs.

SLAV 499 Directed Study (1-3) For advanced students, by permission of department chairman. Course may be repeated to a maximum of six hours if content differs.

SOCY — Sociology

SOCY 100 Introduction to Sociology (3) The fundamental concepts and principles of sociology. Includes consideration of culture, patterns of social interaction, norms, values, social institutions, stratification, and social change.

SOCY 105 Introduction to Contemporary Social Problems (3) An examination of contemporary social problems through sociological perspectives, ways in which social problems are part of the organization of society, a detailed study of selected social problems including social conflict and social inequality. Not open to students who already have credit for SOCY 210.

SOCY 120 Urban Sociology (3) Prerequisite: SOCY 100 or 105. Urban growth and expansion characteristics of city populations, urban institutions and personality patterns, relations of city and country.

SOCY 201 Introductory Statistics For Sociology (4) Three lectures and two hours drill per week. Prerequisites: SOCY 100 or 105 and MATH 110 or equivalent. Elementary descriptive and inferential statistics. Construction and percentaging of bivariate contingency tables, frequency distributions and graphic presentations, measures of central tendency and dispersion parametric and nonparametric measures of association and correlation, regression, probability, hypothesis testing, the normal, binomial and chi-square distributions, point and interval estimates.

SOCY 202 Introduction to Research Methods in Sociology (4) Prerequisite: SOCY 201. The underlying logic, major strategies, specific techniques and skills of sociological research. Research design, measurement, data collection, sampling, field research experiments, surveys, index and scale construction, data analysis, interpretation and report writing.

SOCY 203 Sociological Theory (3) Prerequisite: SOCY 100 or 105. Development of the science of sociology, historical backgrounds, recent theories of society. Required of all sociology majors.

SOCY 230 Sociological Social Psychology (3) Social psychology of groups such as committees, teams, clubs, sects, social movements, crowds and publics. Origin of the social self, role behavior, inter-group and intragroup relations.

SOCY 300 American Society (3) The social structure and organization of American society with special reference to recent social change. A sociological perspective on urban and other population trends, the character structure, values and ideology of Americans - social movements and changes in work, family life and recreation.

SOCY 305 Scarcity and Modern Society (3) Prerequisite: SOCY 100 or 300. The problems of resource depletion and the deterioration of the environment. Emphasis is on the relationship to life styles, individual consumer choices, cultural values, and institutional failures. Projection of the future course of American society on the basis of the analysis of scarcity, theories of social change, current trends, social movements, government actions, and the futurist literature.

SOCY 324 Racism and Intergroup Conflict (3) Prerequisite: SOCY 100 or 105. An introduction to the study of racism and intergroup conflict in the U.S. history of racism; racial stereotypes, roles, and myths; individual and institutional racism; race and its relation to culture, stratification, social movements, and social change.

SOCY 325 Sex Roles (3) Sex-role differentiation and sex inequality from a sociological perspective. Institutional bases of sex inequality, cultural views of the sexes, sex-role socialization and sex-role change. Emphasis on contemporary American society.

SOCY 327 Introduction to the Study of Deviance (3) Prerequisite: SOCY 100 or 105. An introduction to the sociological study of deviant behavior, covering such topics as mental illness, sexual deviance, and the use of drugs. Students may not receive credit for SOCY 327 if they have completed SOCY 427.

SOCY 330 Community Organization (3) Prerequisite: SOCY 100 or 105. Community organization and its relation to social welfare; analysis of community needs and resources; health, housing, recreation, community centers, neighborhood projects.

SOCY 331 Work, Bureaucracy, and Industry (3) A sociological approach to the world of work, occupational careers, and personal experiences in the bureaucratic organizations of modern industrial society.

SOCY 333 Technology and Society (3) An examination of human evolution and the interplay between technological discoveries and changes in human societies. The impact of technology on agriculture, the industrial revolution, politics, economics, and health, education and welfare, as these affect changes in social organizations. The development of small cities, the better utilization of energy, the use of wealth and abundance and its relation to the division of labor, and the role of technology in shaping of new forms of political and economic organizations.

SOCY 341 Inequality in American Society (3) The sociological study of the status and treatment of the poor, minorities, the aged, women, deviant subcommunities and the physically handicapped. The dynamics of inequality, its social production, politics, future and ideological bases, Utopian communities; efforts to eliminate inequality.

SOCY 343 Sociology of Marriage and Family (3) Prerequisite: SOCY 100 or 105. The sociological study of marriage and family life, including a consideration of demographic trends in marriage, childbearing, divorce; sociological theories of mate selection, marital interaction, and marital dissolution. The course includes discussion of some contemporary controversial issues, such as the relationship of unmarried couples, alternative marriage forms, abortion, and violence in the family.

SOCY 359 Social Field Training (1-3) Prerequisites: permission of instructor and at least 12 hours of sociology credit. Enrollment restricted to available placements. The student will be responsible to an agency for a program of in-service training. Group meetings, individual conferences and written program reports will be a required part of the course.

SOCY 388 Independent Research in Sociology (3) Prerequisite: SOCY 100 or 105 and consent of instructor. For honors students only. This course is designed for the needs of the honors students in sociology.

SOCY 389 Independent Reading Course in Sociology (3) Prerequisite: SOCY 100 or 105 and consent of instructor. For honors students only. This course is designed for the needs of the honors students in sociology.

SOCY 398 Special Topics in Sociology (1-3) Prerequisite: SOCY 100 or 105; topics of special interest to both sociology majors and non-majors. Repeatable for credit when the subject matter changes, up to a maximum of six credits.

SOCY 399 Independent Study in Sociology (1-6) Prerequisites: consent of instructor and 12 credits in sociology to include one or more of - SOCY 201, 202, 203. Integrated reading or research under the direction and supervision of a faculty member. A maximum of 6 credits may be earned by a student for the same field experience in SOCY 386/387 and 399 combined.

SOCY 401 Intermediate Statistics For Sociologists (3) Prerequisite: SOCY 201 or equivalent, and six additional credits in sociology. Intermediate correlation techniques, analysis of variance, sampling, additional nonparametric techniques, additional topics in inferential statistics.

SOCY 402 Intermediate Procedures For Data Collection (3) Prerequisite: SOCY 202 or equivalent or permission of the instructor. An intermediate survey of the major research methods used by sociologists, including survey research, experimentation, observation, archival research, and in-depth interviewing. The selection of an appropriate research method, with analysis of the strengths and weaknesses of various methods, practical issues, data collection and preparation, and analytical techniques.

SOCY 403 Intermediate Sociological Theory (3) Prerequisite: SOCY 203. Major theoretical approaches e.g., Functionalism conflict, symbolic interactionism, and their implicit methods of logic illustrated by case studies. Original works of major theorists in historical perspective.

SOCY 404 Methods of Quantitative Analysis (3) Prerequisite: SOCY 202 or equivalent or permission of instructor. A computer-based approach to the analysis of sociological data. Statistical program packages such as spss, using both card input and computer terminals, data storage and file manipulation. Use of multivariate statistical techniques, national sample surveys, census, and artificial data sets constructed to illustrate specific features of the techniques.

SOCY 410 Population I (3) Prerequisite: junior standing; SOCY 100 or 105 not required. Population distribution and growth; sources of demographic data; population composition; population theories; mortality; fertility and family planning, migration; and population problems and policy.

SOCY 411 Population II (3) Prerequisite: SOCY 410 or permission of instructor. Introduction to basic techniques for analyzing population change. The measurement of fertility, mortality, and migration.

SOCY 423 Ethnic Minorities (3) Prerequisite: SOCY 100 or 105. Basic social processes in the relations of ethnic groups, immigration groups and the Negro in the United States; ethnic minorities in Europe.

SOCY 424 Sociology of Race Relations (3) Prerequisite: 9 credits in sociology or permission of instructor. Analysis of race-related issues, with a primary focus on American society. The historical emergence, development, and institutionalization of racism, the impact of racism on its victims, and racially based conflict.

SOCY 425 Sex Roles and Social Institutions (3) Prerequisite: SOCY 325 or permission of instructor. Relationship between sex roles and the structure of one or more social institutions (e.g., the economy, the family, the political system, religion, education). The incorporation of sex roles into social institutions, perpetuation or transformation of sex roles by social institutions, how changing sex roles affect social institutions.

SOCY 426 Sociology of Religion (3) Prerequisite: SOCY 100 or 105. Varieties and sources of religious experience. Religious institutions and the role of religion in social life.

SOCY 427 Deviant Behavior (3) Prerequisite: SOCY 327 or 12 credits in sociology or permission of instructor. Current theories of the genesis and distribution of deviant behavior, and their implications for a general theory of deviant behavior. Definitions of deviance, labeling theory, secondary deviance.

SOCY 430 Sociology of Personality (3) Prerequisite: SOCY 100 or 105. Development of human nature and personality in contemporary social life, processes of socialization, attitudes, individual differences and social behavior.

SOCY 431 Formal and Complex Organizations (3) Prerequisite: SOCY 331 or permission of instructor. The concept of formal organization. The study of functioning and control in the operation of bureaucracies such as corporations and in large-scale organizations such as military, religious and educational hierarchies. Forms of recruitment, internal mobility and organizational personality. Relations between large-scale organizations and with the larger society.

SOCY 432 Collective Behavior (3) Prerequisite: SOCY 100 or 105 or 230 or permission of instructor. Unlike most sociology courses which focus on structured groups, this course examines instances of transient behavior: crowds, disasters, hysterical contagion, revolution, and social movements, including American Utopian experiments.

SOCY 433 Social Control (3) Prerequisite: SOCY 100 or 105 or 200. Forms, mechanism, and techniques of group influence on human behavior, problems of social control in contemporary society.

SOCY 440 Sociology of the Self-Concept (3) The nature of the self-concept and the social forces that mold it. Major sociological, psychological, and psycho-analytic theories of the self-concept. Self-concept motives, mechanisms of self-defense, and the nature of a healthy self-concept. Empirical research dealing with the bearing of social interaction, social structure, social context and social institutions on the self-concept.

SOCY 441 Social Stratification and Inequality (3) Prerequisite: SOCY 341 or permission of instructor. The sociological study of social class, status, and power. Topics include theories of stratification, correlates of social position, functions and dysfunctions of social inequality, status inconsistency, and social mobility.

SOCY 443 The Family and Society (3) Prerequisite: SOCY 343 or permission of instructor. Study of the family as a social institution; its biological and cultural foundation, historic development, changing structure, and function; the interaction of marriage and parenthood, disorganizing and reorganizing factors in present day trends.

SOCY 445 Sociology of the Arts (3) Prerequisite: SOCY 100 or 105. Functions of the arts as a social institution. Social role of the artist. Recruitment to and organizational structure of artistic professions. Art forms and social characteristics of audiences. Changing technology and social values as reflected in artistic expression.

SOCY 447 Small Group Analysis (3) Prerequisites: SOCY 100 or 105 and 201 (sociological statistics) or equivalent. Analysis of small group structures and dynamics. Review of research on small groups in real life settings and in laboratories. Presentation of techniques used in small groups.

SOCY 450 Applied Sociology (3) Prerequisites: SOCY 201, 202, 203. The uses of sociology in non-academic settings. The ethics and social organization of sociological research, the range of applied settings, the development and evaluation of proposals, and the communication of sociological findings to non-sociological audiences.

SOCY 457 Sociology of Law (3) Prerequisite: SOCY 100 or 105. Law as a form of social control; interrelation between legal and other conduct norms as to their content, sanctions, and methods of securing conformity; law as an integral part of the culture of groups, factors and processes operative in the formation of legal norms as determinants of human behavior.

SOCY 460 Sociology of Work (3) Prerequisite: SOCY 331 or permission of instructor. Analysis of the American work world with special attention to the impact of social change and occupational conflicts on the individual worker. Professionalization, career patterns, problems of minority groups and the future of work.

SOCY 462 Industrial Sociology (3) Prerequisite: SOCY 331 or permission of instructor. The sociology of human relations in American industry and business. Complex industrial and business organization as social systems. Social relationships within and between industry, business, community and society.

SOCY 464 Military Sociology (3) Prerequisite: SOCY 100 or 105. Social change and the growth of military institutions. Complex formal military organizations. Military service as an occupation or profession. The sociology of military life. Relations between military institutions, civilian communities and society.

SOCY 465 The Sociology of War (3) Prerequisite: SOCY 100 or 105. The origin and development of armed forces as institutions, the social causes, operations and results of war as social conflict, the relations of peace and war and revolution in contemporary civilizations.

SOCY 466 Sociology of Politics (3) Prerequisite: 9 credits in sociology. An introduction to the sociology of political phenomena. Consideration of the basic concepts and major findings in the field, the relationship of the polity to other institutional orders of the society; the relationship of political activity in america to the theory of democracy.

SOCY 467 Sociology of Education (3) Prerequisites: SOCY 100 or 105 or permission of the instructor. Listed also as EDSF 430. Sociological analysis of educational institutions and their relation to society: goals and functions, the mechanisms of social control, and the impacts of stratification and social change. Study of the school as a formal organization, and the roles and subcultures of teachers and students.

SOCY 470 Rural-Urban Relations (3) Prerequisite: SOCY 100 or 105. The ecology of population and the forces making for change in rural and urban life; migration, decentralization and regionalism as methods of studying individual and national issues. Applied field problems.

SOCY 473 The City (3) Prerequisite: SOCY 100 or 105. The rise of urban civilization and metropolitan regions; ecological process and structure; the city as a center of dominance, social problems, control and planning.

SOCY 474 Soviet Ethnic Issues (3) Ethnic processes and issues in the Soviet Union. The major ethnic groups in the U.S.S.R. cultural, political, religious, economic, and other aspects of Soviet ethnicity.

SOCY 498 Selected Topics in Sociology (1-3) Prerequisite: SOCY 100 or 105. Topics of special interest to advanced undergraduates in sociology. Such courses will be offered in response to student request and faculty interest. No more than 6 credits may be taken by a student in selected topics.

SPAN — Spanish

SPAN 100 Applied Spanish (3) Vocabulary and structures pertinent to specific professions and vocations: medicine, nursing, law enforcement, firefighting, and social work. Cannot be used to satisfy divisional or Spanish major language requirements.

SPAN 101 Elementary Spanish (4) Four recitations per week, and one optional laboratory hour. Introduction to basic structures, with emphasis upon understanding and speaking. Normally leads to 102, but gifted students may be recommended for 102H.

SPAN 102 Elementary Spanish (4) Four recitations per week, and one optional laboratory hour. Continuation of SPAN 101, with increasing emphasis upon reading skill, reinforced by discussion and composition.

SPAN 103 Review of Elementary Spanish (4) An intensive beginning course in Spanish language skills: guided practice in reading and writing, understanding the spoken language and conversation, to enable the student to move more quickly to advanced courses. Enrollment restricted to students who have had at least two years of Spanish or the equivalent and who do not qualify for SPAN 203, and to students who already have a good background in at least one other language (successful completion of level 4 in high school, or 115 or 104 or equivalent at the University level).

SPAN 203 Intermediate Spanish (4) Four recitations per week, and one optional laboratory hour. Continued development of the skills of understanding and speaking with supplementary attention to reading and writing. Enriched course of study, with broad oral base and related development of reading and writing.

SPAN 204 Review of Oral and Written Spanish (3) Prerequisite: SPAN 203. A practical language course recommended for all students continuing in Spanish. May be taken concurrently with SPAN 221 or SPAN 205.

SPAN 205 Intermediate Conversation (3) Prerequisite: SPAN 203 or permission of instructor. Provides an opportunity to develop fluency in oral Spanish.

SPAN 221 Readings in Spanish (3) Prerequisite: SPAN 204. Selected readings from various genres in Spanish and Spanish American literature. Discussion and brief written reports in Spanish.

SPAN 301 Review Grammar and Composition (3) Prerequisite: SPAN 204 or equivalent. An intensive review of grammar and practice in Spanish composition.

SPAN 302 Review Grammar and Composition (3) Prerequisite: SPAN 301 or equivalent.

SPAN 310 Spanish Phonetics (3) Prerequisites: SPAN 204 or 205. Descriptive study of the Spanish sound system. Practice in phonetic perception, transcription, and articulation. Particular attention to sentence phonetics, juncture, rhythm, stress, pitch.

SPAN 311 Advanced Conversation I (3) Prerequisite: SPAN 204 or 205 or consent of instructor. Designed to develop fluency and accuracy in speaking Spanish.

SPAN 312 Advanced Conversation II (3) Prerequisite: SPAN 205 or 311 or consent of instructor.

SPAN 315 Commercial Spanish (3) Prerequisite: SPAN 301 or equivalent or consent of instructor. Designed to give a knowledge of correct commercial Spanish including letters and business forms.

SPAN 316 Practicum in Translation I (3) Prerequisite: SPAN 301 or permission of instructor. Translation of non-literary, non-technical texts of expository prose into Spanish or English. Emphasis on the expansion of vocabulary and on the morphological differences in both languages.

SPAN 317 Practicum in Translation II (3) Prerequisite: SPAN 316 or permission of instructor. Continuation of SPAN 316. Emphasis on syntactical differences between Spanish and English.

SPAN 318 Translation of Technical Texts (3) Prerequisite: SPAN 317 or permission of instructor. Translation into Spanish or English of texts pertinent to medicine, social work, law or international affairs. May be repeated to a maximum of 6 credits, with change of topic.

SPAN 321 Survey of Spanish Literature: 12th-17th Century (3)

SPAN 322 Survey of Spanish Literature: 18th-20th Century (3)

SPAN 323 Survey of Spanish-American Literature (3) Basic survey of the history of Spanish-American literature.

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SPAN 356 Practicum in Translation III (3) Prerequisite: SPAN 317 or permission of instructor. Translation of descriptive and narrative texts into Spanish or English.

SPAN 357 Practicum in Translation IV (3) Prerequisite: SPAN 356 or permission of instructor. Translation into Spanish or English of texts limited to the dialog form.

SPAN 378 Pro-seminar in the Hispanic Literatures (3) Prerequisite: SPAN 321-322 (for Spanish topic), SPAN 323-324 (for Spanish-American topic). May be repeated to a maximum of six credits, with change of topic.

SPAN 399 Independent Study in Spanish (1-3) Prerequisite: permission of instructor. Specific readings in literature under the supervision of a faculty member of the department. Repeatable to a maximum of three credits.

SPAN 401 Advanced Composition (3) Exercises in practical stylistics, with special emphasis on idiomatic and syntactic structures.

SPAN 402 Advanced Composition (3) Exercises in practical stylistics, with special emphasis on idiomatic and syntactic structures.

SPAN 404 Oral Practice For Non-native Teachers of Spanish I (3) Prerequisite: consent of instructor. Development of fluency in Spanish with stress on correct sentence structure, pronounciation and idiomatic expression.

SPAN 405 Oral Practice For Non-native Teachers of Spanish II (3) Prerequisite: SPAN 404, a continuation of SPAN 404.

SPAN 408 Great Themes of the Hispanic Literatures (3) Pervading themes in the literature of Spain or Spanish-America. Each theme will be announced when the course is offered.

SPAN 409 Great Themes of the Hispanic Literatures (3) Pervading themes in the literature of Spain or Spanish-America. Each theme will be announced when the course is offered.

SPAN 410 Literature of the Middle Ages (3) Spanish literary history from the eleventh through the fifteenth century. Reading of representative texts. This course covers until 1350.

SPAN 411 Literature of the Middle Ages (3) Spanish literary history from the eleventh through the fifteenth century. Reading of representative texts. This course covers from 1350 to 1500.

SPAN 412 The Romancero (3) Origin, nature and influence. Extensive reading in each of the respective sub-genres.

SPAN 416 Practicum in Translation V (3) Prerequisite: SPAN 357 or permission of instructor. Translation of complete literary texts from Spanish into English. Presentation and comparison of special problems encountered in individual projects.

SPAN 417 Practicum in Translation VI (3) Prerequisite: SPAN 416 or permission of instructor. Translation of complete literary texts from Spanish into English. Evaluation of different renditions of the originals. Problems of interpretation and literary analysis, structure and criticism.

SPAN 418 Hispanic Literature in Translation (3) May be repeated to a maximum of six credits, with change of topic.

SPAN 420 Poetry of the 16th Century (3) Prerequisite: SPAN 321 or equivalent. Selected readings and literary analysis.

SPAN 421 Prose of the 16th Century (3) Prerequisite: SPAN 321 or equivalent. Selected readings and literary analysis.

SPAN 424 Drama of the Sixteenth Century (3) From the earliest autos and pasos, the development of Spanish drama anterior to Lope de Vega, including Cervantes.

SPAN 425 Spanish Civilization (3) A survey of 2000 years of Spanish history, outlining the cultural heritage of the Spanish people, their great men, traditions, customs, art, and literature, with special emphasis on the interrelationship of social and literary history. Conducted in Spanish.

SPAN 426 Spanish Civilization (3) A survey of 2000 years of Spanish history outlining the cultural heritage of the Spanish people, their great men, traditions, custom art, and literature, with special emphasis on the interrelationship of social and literary history. Conducted in Spanish.

SPAN 430 Cervantes: Don Quijote (3) Prerequisite: SPAN 321 or equivalent.

SPAN 431 Cervantes: Novelas Ejemplares and Entremeses (3) Prerequisite: SPAN 321 or equivalent.

SPAN 434 Poetry of the 17th Century (3) Prerequisite: SPAN 321 or equivalent. Selected readings, literary analysis, and discussion of the outstanding poetry of the

period, in the light of the historical background.

SPAN 435 Prose of the 17th Century (3) Prerequisite: SPAN 321 or equivalent. Selected readings, literary analysis, and discussion of the outstanding prose of the period, in the light of the historical background.

SPAN 436 Drama of the Seventeenth Century (3) Devoted to Lope de Vega, dramatic theory and the Spanish stage.

SPAN 437 Drama of the Seventeenth Century (3) Drama after Lope de Vega to Calderon de la Barca and the decline of the Spanish theater.

SPAN 440 Literature of the Eighteenth Century (3) Traditionalism, Neo-Classicism, and Pre-Romanticism in prose, poetry, and the theater; esthetics and poetics of the enlightenment.

SPAN 441 Literature of the Eighteenth Century (3) Traditionalism, Neo-Classicism, and Pre-Romanticism in prose, poetry, and the theater; esthetics and poetics of the enlightenment.

SPAN 446 Latin American Civilization I (3) A survey of the cultural heritage of the Latin American peoples from the Pre-Columbian Period to independence. Hispanic and other European influences. Conducted in Spanish.

SPAN 447 Latin American Civilization II (3) A survey of the cultural heritage of the Latin American peoples from independence to the present. Hispanic and other European influences. Conducted in Spanish.

SPAN 448 Special Topics in Latin American Civilization (3) An intensive study of a selected topic related to Latin American civilization. This course may be taken no more than twice. Conducted in Spanish.

SPAN 449 Special Topics in Spanish Civilization (3) An intensive study of a selected topic related to Spanish civilization. Repeatable to a maximum of six credits if content differs.

SPAN 452 The Romantic Movement in Spain (3) Poetry, prose and drama of the Romantic and Post-Romantic periods.

SPAN 454 Nineteenth Century Fiction (3) Significant novels of the nineteenth century.

SPAN 456 Nineteenth Century Drama and Poetry (3) Significant dramas and poetry of the Realistic Period.

SPAN 460 The Generation of 1898 and Its Successors (3) Authors and works of all genres of the generation of 1898 and those of the immediately succeeding generation.

SPAN 461 The Generation of 1898 and Its Successors (3) Authors and works of all genres of the generation of 1898 and those of the immediately succeeding generation.

SPAN 462 Twentieth Century Drama (3) Significant plays of the twentieth century.

SPAN 464 Contemporary Spanish Poetry (3) Spanish poetry from the generation of 1927 to the present.

SPAN 466 The Contemporary Spanish Novel (3) The novel and the short story from 1940 to the present.

SPAN 468 Modernism and Post-modernism in Spain and Spanish-America (3) A study of the most important works and authors of both movements in Spain and Spanish-America.

SPAN 469 Modernism and Post-modernism in Spain and Spanish-America (3) A study of the most important works and authors of both movements in Spain and Spanish-America.

SPAN 480 Spanish-American Essay (3) A study of the socio-political contents and aesthetic qualities of representative works from the colonial to the contemporary period.

SPAN 481 Spanish American Essay (3) A study of the socio-political contents and aesthetic qualities of representative works from the colonial to the contemporary period, with emphasis on the essay of the twentieth century.

SPAN 488 Spanish-American Fiction (3) Representative novels and/or short stories from the Wars of Independence to the present or close analysis of major contemporary works. Subject will be announced each time course is offered.

SPAN 489 Spanish-American Fiction (3) Representative novels and/or short stories from the Wars of Independence to the present or close analysis of major contemporary works. Subject will be announced each time course is offered.

SPAN 491 Honors Reading Course: Poetry (3) Supervised reading to be taken by students admitted to the honors program or upon consultation with the instructor.

SPAN 492 Honors Reading Course: Novel (3) Supervised reading to be taken by students admitted to the honors program or upon consultation with the instructor.

SPAN 493 Honors Reading Course: Drama (3) Supervised reading to be taken by students admitted to the honors program or upon consultation with the instructor.

SPAN 496 Honors Seminar (3) Required of all students in the honors program. Other students will be admitted on special recommendation. Conducted in Spanish. Discussion of a central theme with related investigation by students.

SPAN 498 Spanish-American Poetry (3) Main trends, authors and works from the conquest to Ruben Dario.

SPCH — Speech

SPCH 100 Basic Principles of Speech Communication (3) Prerequisite for advanced speech courses. A study of oral communication principles, including verbal and nonverbal language, listening, group dynamics, and public speaking. Emphasis in this course is upon the application of these principles to contemporary problems and upon the preparation of different types of oral discourse. SPCH 100 and 107 may not both be used for credit.

SPCH 107 Technical Speech Communication (3) A study of oral communication as it is part of technical fields. Emphasis in this course is on the principles and techniques of interviewing, group discussion, listening, and informative and persuasive briefings and speeches. SPCH 100 and 107 may not both be used for credit.

SPCH 110 Voice and Diction (3) Emphasis upon the improvement of voice, articulation, and phonation. May be taken concurrently with SPCH 100.

SPCH 125 Introduction to Interpersonal Communication (3) Communication processes in dyadic relationships.

SPCH 200 Public Communication (3) A study of rhetorical principles and models of speech composition in conjunction with the preparation and presentation of specific forms of public communication.

SPCH 220 Group Discussion (3) A study of the principles, methods and types of discussion, and their application in the discussion of contemporary problems.

SPCH 230 Argumentation and Debate (3) A study of the fundamental principles of reasoning, analysis, and evidence preparation of debate briefs and presentation of standard academic debate.

SPCH 240 Oral Interpretation (3) The oral interpretation of literature and the practical training of students in the art of reading.

SPCH 325 Parliamentary Law (1) A study of the principles and application of Parliamentary Law as applied to all types of meetings. Thorough training in the use of Robert's Rules of Order.

SPCH 330 Argumentation and Debate in Society (3) Prerequisite: SPCH230 or consent of the instructor. An in-depth study of argumentation in the conduct of contemporary legislative, judicial and political debating.

SPCH 350 Foundations of Communication Theory (3) A study of oral communicative behavior, including problems and processes of symbolizations, aspects of oral language, the involvement of the talker and listener, kinds of signals, and self-revelation through speech.

SPCH 356 Rhetoric and Society (3) A survey of fundamental aspects and approaches to rhetorical theory.

SPCH 360 The Rhetoric of Black America (3) An historical-critical survey of the rhetoric of Black Americans from the colonial period to the present. Emphasis will be placed on the nature and historical antecedents of contemporary black power rhetoric.

SPCH 400 Introduction to Research Methodologies in Speech Communication (3) Prerequisite: speech communication major or minor or consent of the instructor. An introductory survey of empirical and historical-criti cal research methodologies in speech communication. The course is designed to prepare the student to understand and to conduct basic research in the field.

SPCH 420 Advanced Group Discussion (3) Prerequisite: SPCH 220 or consent of the instructor. An examination of current research and techniques in the discussion and conference, including extensive practice in various types of discussions. Emphasis is upon small group leadership and dynamics.

SPCH 422 Interviewing (3) Prerequisite: permission of instructor. Speech principles and practices basic to recognized types of interview, giving special attention to behavioral objectives and communication variables involved in the process of interviewing.

SPCH 423 Communication Processes in Conferences (3) Prerequisite: one course in speech communication or consent of the instructor. Group participation in conferences, methods of problem solving, semantic aspects of language, and the function of conferences in business, industry and government settings.

SPCH 424 Business, Industrial and Government Communication (3) Prerequisite: permission of the instructor. Structure, methodology and application of communication theory in the industrial setting will be emphasized.

SPCH 425 Communication and Sex Roles (3) An investigation of the creation of images of male and female, and masculine and feminine, through communication, the differences in male and female communication behaviors and styles, and the implications of those images and styles for male-female interpersonal transactions.

SPCH 435 Development of Interpersonal Communication Competencies (3) Investigation, development and application of interpersonal communication competencies, including assertiveness, listening, and conflict resolution.

SPCH 440 Advanced Oral Interpretation (3) Prerequisite: SPCH 240. A study of the advanced theories and techniques employed in the interpretation of prose, poetry and drama. Attention is given to selections, analyses, cuttings, script compilations, and the planning of programs and performances in oral interpretation.

SPCH 441 Readers Theatre (3) Prerequisite: SPCH 240 or consent of the instructor. Theories and techniques of readers theatre will be analyzed to enhance the interpreting and directing abilities of students. Special attention will be given to interpretation and direction of prose, drama, and script compilation.

SPCH 450 Classical and Medieval Rhetorical Theory (3) Prerequisite: SPCH 200 or consent of instructor. The theories of speech-making and speech composition as propounded by the Classical Rhetoricians. Special attention is given to Plato, Aristotle, Socrates, Cicero, Quintilian, and St. Augustine.

SPCH 451 Renaissance and Modern Rhetorical Theory (3) Prerequisite: SPCH 200 or consent of the instructor. A study of the development of modern rhetorical theories in Europe and America with consideration of the application of the theories to public address. Special attention is given to Thomas Sheridan, John Walker, George Campbell, Hugh Blair, Richard Whately, James A. Winans, Charles Woolbert, I. A. Richards, and Kenneth Burke.

SPCH 455 Speechwriting (3) Prerequisite: SPCH 200 or consent of the instructor. Intensive study of rhetorical principles of speech composition through study of model speeches and through a practicum in speech writing. Emphasis will be placed on the application of research in speech writing to various forms and styles of speeches.

SPCH 460 American Public Address 1635-1900 (3) Prerequisite: SPCH 200 or consent of the instructor. Course examines the rhetorical development of major historical movements and influential spokesmen from 1635-1900. Emphasis on the Reign of Theocracy, the American Revolution, the Presidential Inaugural as a rhetorical type, the Compromise of 1850, the Lincoln-Douglas Debates, the Civil War rhetoric and the

Populist movement.

SPCH 461 American Public Address in the 20th Century (3) Prerequisite: SPCH 200 or consent of instructor. Course examines the rhetorical development of major historical movements and influential spokesmen from 1900 to the present. Focus on the progressive movement, the rise of labor, women's suffrage, mccarthyism and the evolution of pro- and anti-war rhetoric.

SPCH 462 British Public Address (3) Prerequisite: SPCH 200 or consent of the instructor. A biographical, textual and critical-rhetorical study of Great British speakers and their influences. Special attention will be devoted to the "Golden Age" of British oratory and to the forms and styles of contemporary speakers.

SPCH 470 Listening (3) A study of the listening process, listening variables, listening levels, and the development of effective listening behavior.

SPCH 471 Diffusion of Innovation (3) Diffusion theory and its implications for public communication campaigns.

SPCH 472 Nonverbal Communication (3) Survey of nonverbal communication in human interaction, theory and research on proxemics, kinesics and paralinguistics as expression of relationship, affect and orientation within and across cultures.

SPCH 474 Communication Theory and Process (3) A general survey of introductory material in communication theory.

SPCH 475 Persuasion in Speech (3) Prerequisite: SPCH 200 or 230. A study of the bases of persuasion with emphasis on recent experimental developments in persuasion.

SPCH 476 Foundations of Speech Behavior (3) This course will provide a study of the acquisition of speech, the elements that influence speech behavior, the influences of speech behavior, and a theoretical framework for the analysis of communication situations. Students will apply the theory to analysis of specific communication situations.

SPCH 477 Speech Communication and Language (3) Survey of language acquisition and development in human communication behavior,theory and research on language structure, syntactic, phonological, and cognitive systems as an influence of an individual's orientation and development within and across cultures.

SPCH 478 Speech Communication Colloquim (1) Current trends and issues in the field of speech communication, stressing recent research methods. Recommended for senior and graduate student majors and minors in speech communication. Repeatable to a maximum of 4 hours.

SPCH 482 Intercultural Communication (3) The major variables of communication in an intercultural context. Communication problems created by cultural, racial, and national differences, analysis of stereotypes, values, and cultural assumptions influencing verbal and nonverbal communication.

SPCH 483 Urban Communication (3) A study of communication variations in the urban community, exploration of strategies for improving communication.

SPCH 488 Speech Communication Internship (1-6) Registration by permission of adviser only. This independent internship is designed to give the speech communication student practical career experience with a speech communication professional in the Washington Metropolitan area. Limited to a maximum of six credits.

SPCH 489 Speech Communication Workshop (1-6) Workshops devoted to special, in-depth study in speech communication. Course may be repeatable to a maxium of six semester hours.

SPCH 498 Seminar (3) Prerequisites: senior standing and consent of instructor. Present-day speech research.

SPCH 499 Honors Seminar (3) For honors students only. Readings, symposiums, visiting lectures, discussions.

STAT — Statistics and Probability

STAT 100 Elementary Statistics and Probability (3) Prerequisite: MATH110 or exemption from MATH 110 by a satisfactory score on a departmental placement examination. Simplest tests of statistical hypotheses; applications to before-and-after and matched pair studies. Events, probability, combinations, independence. Binomial probabilities, confidence limits. Random variables, expected values, median, variance. Tests based on ranks. Law of large numbers, normal approximation. Estimates of mean and variance. (Students who have completed MATH 111 or any MATH or STAT course with a prerequisite of MATH 141 may not obtain credit for STAT 100).

STAT 250 Introduction to Statistical Models (3) Prerequisite: MATH 220 or equivalent. Applications of basic ideas of probability and statistics to epidemics, genetics, learning models, population growth, queuing, reliability and traffic problems. Topics include random variables, distributions, expectations, Markov chains, renewals, hypotheses testing and estimation, with emphasis on discrete models and intuitive approach. Choice of applications can vary according to class interest.

STAT 400 Applied Probability and Statistics I (3) Prerequisite: MATH 141. Random variables, standard distributions, moments, law of large numbers and central limit theorem. Sampling methods, estimation of parameters, testing of hypotheses.

STAT 401 Applied Probability and Statistics II (3) Prerequisite: STAT 400. Point estimation - sufficient, unbiased, and consistent estimators. Interval estimation. Minimum variance and maximum likelihood estimators. Testing of hypotheses. Regression correlation and analysis of variance. Sampling distributions. Sequential tests, elements of non-parametric methods.

STAT 410 Introduction to Probability Theory (3) Prerequisites: MATH 240 and MATH 241. Probability and its properties. Random variables and distribution functions in one and several dimensions. Moments. Characteristic functions. Limit theorems.

STAT 411 Introduction to Stochastic Processes (3) Prerequisite: STAT 250 or 400 or equivalent. Elementary stochastic processes. Renewal process, random walks, branching process, discrete Markov chains, first passage times, Markov chains with a continuous parameter, birth and death processes. Stationary processes.

STAT 420 Introduction to Statistics (3) Prerequisite: STAT 410 or equivalent. Point estimation, sufficiency, completeness, Cramer-Rao inequality, maximum likelihood. Confidence intervals for parameters of normal distribution. Hypotheses testing, most powerful tests, likelihood ratio tests. Chi-square tests, analysis of variance, regression, correlation. Nonparametric methods.

STAT 421 Elements of Statistical Inference (3) Prerequisite: STAT 420 or equivalent. Rank tests, confidence and tolerance intervals, Kolmogorov-Smirnov tests. Sequential analysis, multivariate analysis. Decision theory, Bayesian and minimax procedures. Sampling theory.

STAT 440 Sampling Theory (3) Prerequisite: STAT 401 or STAT 420, or consent of the instructor. Simple random sampling. Sampling for proportions. Estimation of sample size. Sampling with varying probabilities of sampling. Sampling stratified, systematic, cluster, double, sequential, incomplete.

STAT 450 Regression and Variance Analysis (3) Prerequisite: STAT 401 or 420. One, two, three and four-way layouts in analysis of variance, fixed effects models, linear regression in several variables, Gauss-Markov-Theorem, multiple regression analysis, experimental designs.

STAT 460 Applied Nonparametric Statistics (3) Prerequisite: a statistics course other than STAT 100. Review of basic statistical ideas. Sign tests and ranking methods for one and two samples, one-way layout, two-way layout, correlation and regression, including significance tests, nonparametric confidence intervals and robust point estimates. Goodness-of-fit, contingency tables, exact and Chi-square test for homogeneity and independence. Techniques illustrated using data from social biological and behavioral sciences.

STAT 464 Introduction to Biostatistics (3) Prerequisite: one semester of calculus and junior standing. Probabilistic models. Sampling. Some applications of probability in genetics. Experimental designs. Estimation of effects of treatment. Comparative experiments. Fisher-Irwin test. Wilcoxon tests for paired comparisons. Not acceptable for credit towards degrees in mathematics or statistics.

STAT 498 Selected Topics in Statistics (1-6) Prerequisite: permission of the instructor. Topics of special interest to advanced undergraduate students will be offered occasionally under the general guidance of the MATH/STAT major committee. Students register for reading in statistics under this number. Repeatable to a maximum of 16 credits.

TEXT — Textiles

TEXT 105 Textiles in Contemporary Living (3) Three lectures per week. A multidisciplinary approach to the consumer in the near environment with emphasis on apparel and environmental textiles.

TEXT 150 Introduction to Textile Materials (3) Two lectures and one two-hour laboratory per week. An introduction to the properties of textile materials. Behavior of textile materials are observed in relation to environmental conditions which influence aesthetics, comfort and performance.

TEXT 221 Apparel I (3) Six hours of laboratory per week. A study of the fundamental principles and processes of pattern design and apparel construction. The relation of commercial patterns and construction techniques to apparel design problems.

TEXT 222 Apparel II (3) Prerequisite: TEXT 221 Apparel design through the flat pattern method. Development of portfolios as well as full scale fashion design projects from original patterns. Emphasis on successful integration of pattern design with construction processes in contemporary fabrics.

TEXT 250 Textile Materials: Evaluation and Characterization (3) Two lectures and one two-hour laboratory per week. Prerequisite: TEXT 150. An investigation of the behavior of textile materials in relation to environmental factors and conditions of service influencing performance, comfort and aesthetics. Laboratory experience provides an opportunity to explore a variety of textile materials and methods of evaluation.

TEXT 345 History of Costume I (3) The development of ancient and Non-Western forms of dress, including Greek, Roman, Early European, Middle Eastern, Far Eastern and African costume. Emphasis on clothing as an expression of culture and as an indicator of cultural change.

TEXT 347 History of Costume II (3) The development of European and American dress from the Renaissance to the present, relating the history of costume to changing technology, social attitudes and trends in the popular and fine arts.

TEXT 355 Textile Furnishings (3) Three lectures per week. Prerequisite: TEXT 150. The performance of textile furnishings, including both the residential and contract-commercial markets. The selection, material properties, specifications, use and care of textile furnishings. Carpet and floor coverings, upholstered furniture, draperies and window coverings, wall coverings, bedding and mattresses, and domestic textiles.

TEXT 363 History of Textiles (3) A study of historic and contemporary fibers and fabrics. The analysis of designs and techniques of decorating fabrics and the relationship of textiles to the aesthetic and developmental cultures of society.

TEXT 365 Fashion Merchandising (3) Prerequisite: consent of instructor. Analysis of fashion trends and their effect on retail merchandising. Emphasis on the buying and selling process, including the calculations necessary to plan and estimate seasonal purchases, mark-ups, turnover, open-to-buy, markdowns and stock:sales ratios.

TEXT 375 Economics of the Textile and Apparel Industry (3) Three lectures per week. Prerequisites: ECON 201 and 203. Trends in the production and consumption of textiles and apparel, economic analysis of the textile and apparel industries, factors affecting changes in output, price, location and market structure.

TEXT 385 Junior Honors Seminar (1) Limited to juniors in the departmental honors program. Readings, reports and discussion of selected topics.

TEXT 388 Field Work and Analysis in Textiles (3-12) Supervised, professional, field work experience in retailing, industry or government. A seminar and a

written critique of the field work experience will be required to relate formal academic study to student work experiences. Students must apply a semester in advance. Enrollment is by permission of the department and is limited to majors. May be repeated to a maximum of 12 credits.

TEXT 396 Field Work and Analysis in Textiles (3-12) Supervised, professional, field work experience in retailing, industry or government. A seminar and a written critique of the field work experience will be required to relate formal academic study to student work experiences. Students must apply a semester in advance and enrollment is by permission of the department and is limited to majors.

TEXT 400 Research Methods (3) Prerequisite: MATH 110 or 115. Research methodology in textiles and consumer economics, with particular emphasis on the application of statistical concepts and techniques to the analysis of data from the areas of textiles and consumer economics. May not be taken by students who have credit in CNEC 400.

TEXT 420 Apparel Design: Draping (3) Two three-hour laboratory periods per week. Prerequisites: APDS 101 and TEXT 222. APDS 220 recommended but not required. Students explore pattern design through draping on the human form. Emphasis is on the interrelationship between material, design and form.

TEXT 425 Advanced Apparel Design (3) Six hours of laboratory per week. Prerequisites: APDS 101, TEXT 250, and TEXT 222. The integration of apparel design skills and principles in solving problems in apparel production, merchandising, and in clothing for special needs.

TEXT 441 Clothing and Human Behavior (3) Three lectures per week. Prerequisites: PSYC 100 and SOCY 100. An exploration of socio-psychological approaches to the study of clothing in relation to human behavior. Social and psychological theories will be examined as possible framework for the study and investigation of clothing.

TEXT 452 Textile Science: Chemical Structures and Properties of Fibers (3) Two lectures and four hours of laboratory per week. Prerequisites: CHEM 104 or consent of instructor. The chemical structure, properties and reactions of the major classes of natural and man-made fibers. The relationship between molecular structure and physical properties of fibers and fabrics. Laboratory includes chemical identification of fibers, preparation of selected fibers and examination of chemical reactions and properties of fibers.

TEXT 454 Textile Science: Finishes (3) Two lectures and four hours of laboratory per week. Prerequisite: TEXT 452 or consent of instructor. A study of the chemical reactions and and mechanisms involved in imparting water repellance, crease resistance and crease recovery properties, shrink-resistance, flame resistance, soil-release properties and moth and mildew resistance to textile materials. Properties of the finished material which affect its end-use. The application of finishes, identification of finishes and a study of the properties of finished fabrics.

TEXT 456 Textile Science: Dyes and Dye Application (3) Two lectures and four hours of laboratory per week. Prerequisite: TEXT 452 or consent of instructor. Examination of the principles and techniques of dyeing and printing of textile materials. Properties of the finished products which affect their end-use.

TEXT 470 Textile and Apparel Marketing (3) Prerequisite: BMGT 350 or consent of instructor. Analysis of the production, pricing, distribution, and promotion of fibers, yarns, fabrics and textile products by end use. Identification of target markets and development of marketing strategies. Application of case study method to problems of textile and apparel firms.

TEXT 488 Senior Honors Thesis (1-4) Limited to undergraduate students in the departmental honors program. An independent literary, laboratory of field study, conducted throughout the student's senior year. Student should register in both fall and spring.

TEXT 498 Special Studies (2-4) Independent study by an individual student or by a group of students in advanced work not otherwise provided in the department. Students must prepare a description of the study they wish to undertake. The plan must be approved by the faculty directing the study and the department chairman.

THET — Theatre

THET 110 Introduction to the Theatre (3) Introduction to the people of the theater, actors, directors, designers and backstage personnel. The core and characteristics of a play script, theatrical forms and styles, and theater history.

THET 120 Acting Fundamentals (3) Basic principles of acting techniques. Exercises structured to develop the student's concentration, imagination, sense and emotional memory. Textual analysis, character analysis and scene study, and the application of these techniques to character portrayal through performance of short scenes.

THET 125 Creative Expression (3) For the non-theater arts major. Exploration of creativity through self expression. Basic techniques of pantomime, improvisation, role playing, communicative and concentrative skills through movement, theater games and group dynamics.

THET 170 Stagecraft (3) A survey of the fundamentals of theatrical productions, with emphasis in the construction of scenery. Practice work on University Theater and experimental theater productions.

THET 185 Makeup (2) The theory and practice of stage makeup covering character analysis, facial anatomy, application of makeup and period styles in theatrical makeup.

THET 221 Speech For the Stage (3) Development of the vocal techniques required for theatrical production including projection, resonance, and character voices. The study and acquisition of the diction of the American stage.

THET 273 Scenographic Techniques (3) Prerequisite: THET 170. An analysis of the graphic approaches used in various stages of planning and execution of a setting for the theater. Study of drafting techniques, presentational conventions, and scene painting techniques unique to the theater.

THET 283 Costume Crafts (3) Study and practical experience in garment construction and related costume crafts as used in theater costume design. Emphasis on celastic armour, jewelry, hat-making and other related theater costuming crafts.

THET 310 The American Theatre (3) An analysis of the theatre people, plays, events, and social forces which shaped an evolution from the colonial beginnings of artistic dependence on England to the uniquely American theatre of today.

THET 311 Play Production (3) A practical study of the various elements and procedures necessary for production of plays for public performance.

THET 320 Intermediate Acting (3) Prerequisites: THET 120 OR 221 or permission of the instructor. Continuation of THET 120. Emphasis on the blueprinting of character development and portrayal for a full length play.

THET 330 Play Directing (3) Prerequisites: THET 120 and 170. A lecture-laboratory course dealing with the techniques of coordination, designing and guiding the production of a script through to performance. Study and practice in stage composition, movement, pacing, script and character analysis, and rehearsal routines. Emphasis on methods of communication a script to an audience.

THET 371 Stage Decor (3) Prerequisite: THET 170. A study of environmental decor, ornaments and properties through the ages and their practical reproduction for a theatrical production.

THET 375 Stage Design (3) Prerequisites: THET 170 and 491. Design-oriented theatre majors are expected to also have credit for THET 273. A study of design theory and style. Methods and techniques of coordination all elements of scenic design for theatre.

THET 415 Playwriting (3) The writing of a one-act and a full-length play.

THET 420 Styles and Theories of Acting (3) Prerequisites: THET 120, 221, 320 or consent of instructor. Emphasis on the philosophical basis and techniques necessary for acting modern realistic drama and acting period style dramas. In-depth study of Stanislavski System and application of those techniques toward performance in scenes. Examination and application of the techniques necessary for the preparation and performance of an acting score for performing Shakespeare. Improvisation. Required attendance at live theatre productions.

THET 421 Movement for Actors (3) Studies and intensive exercises to aid the acting student in understanding physical and emotional energy flow, body placement, alignment and body image. The physical aspects of character.

THET 422 Mime (3) Exploration of the principles and techniques of mime. Concentration on theory, body awareness and control, balance, isolation, illusions, characterizations. Emphasis on solo and duet performance.

THET 423 Stage Combat (3) Principles and techniques of directing fights for the stage with emphasis on hand-to-hand combat, quarterstaff and rapier and dagger. History of hand weapons from primitive man through the nineteenth century.

THET 429 Actor's Studio (1-3) Prerequisite: consent of instructor. Participation in dramatic roles executed under faculty supervision in the department's productions. Eligible students must make commitments and plan performances with course instructor during pre-registration. Repeatable to a maximum of six credits.

THET 430 Advanced Directing For the Stage (3) Prerequisite: THET 330 or consent of instructor. Discussion of the preparation procedures and rehearsal practices necessary for the presentation of a variety of theatrical styles and forms. Emphasis on understanding the relationship between the director, the actor, the script and the audience. A series of student directed scenes supplemented by attendance at theatre productions.

THET 450 American Musical Comedy (3) The evolution of musical comedy through opera to early American extravaganzas and minstrels to the musicals of the 1920's and 1930's. The development and highlights of the form since 1940. The function and form of the libretto, music and lyrics, and the roles of the creative personnel of a musical production. Workshops in performance skills.

THET 451 Musical Comedy Workshop (3) Prerequisite: consent of instructor. Development of the ability to move, act and express through the media of lyric and music.

THET 460 Theatre Management I (3) The practical tools of theatre management, production philosophies, selecting and balancing a season, tickets and box office procedures, budgeting, graphic arts production, advertising, publicity and other promotional devices.

THET 461 Theatre Management II (3) Prerequisite: THET 460 or consent of instructor. Case studies, discussions, lectures and projects concerning advance theatre management decision making and administration, including such areas as personnel relations, contract negotiations, theatrical unions, fund raising, touring, audience development and public relations.

THET 471 Advanced Scenic Design (3) Prerequisites: THET 170, 273, 375 or consent of instructor. Study of period styles and techniques in scenic design. Emphasis on individual projects and multi-use theatres.

THET 472 Stage Property Design (3) Prerequisite: consent of instructor. Materials and techniques for the design and execution of stage properties with special emphasis on period research, special materials, and special effects.

THET 473 Scene Painting (3) Prerequisite: consent of instructor. Scene painting techniques and materials. Three-dimensional realistic scenery and non-realistic two-dimensional backdrops. Individual projects.

THET 474 Stage Management and Technical Direction (3) Intensive practical study of the techniques and procedures for stage management and technical direction. An independent project dealing with the production of a theoretical show.

THET 476 Principles and Theories of Stage Lighting (3) Prerequisite: THET 170, recommended: THET 273. A study of the theories of electrification, instruments, design, color, and control for stage and television. Brief survey of sound for the theatre. Practical work on productions.

THET 477 Advanced Lighting Design (3) Prerequisite: THET 476. Study of history and theory of lighting design. Design exercises in proscenium, in-the-round, thrust, outdoor pageant, circus, concert, spectacle, dance and television lighting. A survey of lighting companies and equipment and architectural lighting.

THET 479 Theater Workshop (1-3) Prerequisite: THET 170 and permission of the instructor. Participation in the technical aspects of theatre production in selected university and experimental theatre productions. Repeatable to a maximum of six credits.

THET 480 Stage Costume History and Design I (3) Basic principles of theatre costume design and introduction to rendering skills. Emphasis on development of design conception, unity, character statement, basic clothing design and period style adaptation.

THET 481 Stage Costume History and Design II (3) One lecture and six hours of laboratory per week. Prerequisite: THET 480. An advanced study of costume design and interpretation leading to understanding and facility in design of stylized productions. Emphasis on design for musical comedy, dance theatre, opera and various non-traditional forms of theatre production.

THET 486 Stage Costume Construction I (3) Study and practical experience in garment construction and related costume crafts as used in theatre costume design. Flat pattern development, textiles, theatrical sewing techniques and organization of the costume construction process.

THET 487 Stage Costume Construction II (3) Study and practical experience in the construction of stage costumes, props and accessories. Pattern development by draping, millinery, corsets, masks, jewelry, armor and period footwear.

THET 490 History of the Theatre I (3) Evolution of the theatre from primitive origins, through the early Renaissance with emphasis on playwrights and plays, theatre architecture and decor, and significant personalities. Extensive use of graphic material, play reading, related theatre-going.

THET 491 History of the Theatre II (3) A continuation of THET 490 beginning with the 16th century and progressing into the 20th, examining the late Renaissance, Elizabethan, Restoration, 17th to 19th century European, and early American theatres. Emphasis on dramatic forms and styles, theatre architecture and decor, and significant personalities. Extensive use of graphic material, play reading, related theatre-going.

THET 495 History of Theatrical Theory and Criticism (3) The development of theatrical theory and criticism from the Greeks to the modern theorist. The philosophical basis of theatre as an art form. Important theorists and the practical application of their theories in either play scripts or theatrical productions. Required attendance at selected live theatre productions.

THET 499 Independent Study (3) Prerequisite: permission of instructor. An independent study course in which each student completes an assigned major theatre project under close faculty supervision. Projects may culminate with term papers, scenic or costume designs, or a stage production. Repeatable to a maximum of six credits.

UMEI — Maryland English Institute

UMEI 001 English as a Foreign Language: Beginning (0) Twenty five hours per week. Intensive course for the non-native speaker of English who has little or no previous knowledge of English. Focus on the rapid acquisition of the basic features of English grammar and pronunciation and on speaking and understanding American English, reading and writing appropriate to the level will be included. Special fee. Carries no credit towards any degree and does not count in the retention plan.

UMEI 002 English as a Foreign Language: Intermediate I (0) Twenty-five hours per week. Intensive course for the non-native speaker of English who has had some previous instruction in English. Emphasis on improving listening and speaking skills, on mastering intermediate grammatical structures, and on expanding vocabulary. Includes practice in reading and writing appropriate to the level. Special fee. Carries no credit towards any degree and does not count in the retention plan.

UMEI 003 English as a Foreign Language: Intermediate II (0) Twenty-five hours per week. Intensive course for the non-native speaker of English who has mastered the essential structures of English grammar. Emphasis on improving communicative skills for a wide range of linguistic situations, on rapid expansion of vocabulary, and on improving reading comprehension and basic writing skills. Special fee. Carries no credit towards any degree and does not count in the retention plan.

UMEI 004 English as a Foreign Language: Intermediate III (0) Twenty-five hours per week. Intensive course for the non-native speaker of English who has a good command of the basic features of spoken and written English. Emphasis on refining speaking and listening skills, on improving reading speed and comprehension of academic texts, and on developing writing skills for academic courses. Special fee. Carries no credit towards any degree and does not count in the retention plan.

UMEI 005 Advanced English as a Foreign Language (0) Twelve hours per week. Semi-intensive course for the nearly proficient non-native speaker of English needing additional language instruction prior to undertaking full-time academic study. Speaking and listening skills; improvement of reading speed and comprehension; and development of writing skills with special emphasis on research papers and use of the University library. Special fee. This course does not carry credit towards any degree at the university and does not count in the retention plan.

UMEI 006 English Pronunciation (0) Individualized class for the non-native speaker of English. Diagnosis of individual pronunciation problems. Practice in the correct pronunciation of English sounds and improvement of ability to speak English with proper stress and intonation patterns. Special fee. This course does not carry credit towards any degree at the University and does not count in the Retention Plan.

UMEI 007 Workshop for Foreign Teaching Assistants (0) For graduate teaching assistants who are not native speakers of English and who need to improve their ability to instruct in English. English grammar and pronunciation. Cultural cues to enhance classroom management and basic instructional techniques. Oral presentations keyed to each student's discipline will be video-taped for individual review. Special fee. This course does not carry credit towards any degree at the University and does not count in the Retention Plan.

URBS — Institute for Urban Studies

URBS 100 Introduction to Interdisciplinary Urban Studies (3) The scope and range of urban studies, and the characteristics of urban life. An interdisciplinary lecture series which meets twice a week, gaming laboratory sessions which meet for two hours once a week, and the development of an urban project. May not be taken by students who have received credit for URBS 260.

URBS 210 Behavioral and Social Dimensions of the Urban Community (3) Three lecture hours per week. Definition of urbanism, urbanization, and urban demography; study of the institutional framework of urban areas, including administration, politics, finances, and communications; explanation of human services and social issues.

URBS 220 Environmental and Technological Dimensions of the Urban Community (3) Three lecture hours per week. Issues involved in understanding the impact of environment and technology on urban living. Emphasis on the metropolis as a physical structure, including its housing, land use and geography; on the metropolis as a physical system, including its environment, engineering and utilities, and on public policy issues of technology in the urban areas.

URBS 320 The City and the Developing National Culture of the United States (3) Prerequisite: permission of instructor or one URBS course. Definition of national culture as contained in values, ideas, ideology, and moral standards but expressed in objects and activities. History of the city in the United States as related to cultural phases; the city and innovation in architecture and sculpture; in literature and the fine arts; individual cities as creators of cultural history; the city and mass culture.

URBS 350 Introduction to Urban Field Study (3) Prerequisite: permission of instructor or one URBS course. Instruction in the techniques of inquiry into urban conditions. Training in use of descriptive statistics to summarize data. Selection of problems for study, design of research, preparing conclusions. Comparison of team-research approach to individual investigation. Study of the urban community through field projects.

URBS 397 Honors Independent Reading (3) Prerequisite: admission to honors program in URBS or other departments. Directed reading in contemporary urban studies.

URBS 399 Independent Study in Urban Topics (3) Prerequisite: permission of instructor or one URBS course. Directed research and study of selected aspects of urban affairs.

URBS 420 Seminar in Urban Literature (3) Prerequisite: two URBS courses or permission of the instructor. The works of several of the major 20th century writers in urban studies. A comparative analysis of the perspectives of these writers on theoretical and substantive urban issues, as a basis for more advanced study in the theory and process of urbanization.

URBS 438 Urban Internship (1-6) Prerequisite: permission of the department. Supervised field training in urban-oriented programs. Emphasized areas of interest are (1) neighborhoods and communities, (2) organizations and agencies, (3) specific programs. The student will be assigned to a specific agency or project and will be responsible to that agency. Class meetings, written reports, instructor conferences, and a student's critique of his experience are included. Repeatable to a maximum of six credits.

URBS 440 City and Regional Economic Development (3) Prerequisite: URBS 210 and ECON 105, or ECON 201, or ECON 205. Emphasis on urban finance and causes of urban fiscal stress, the spatial patterns of employment and population, urban labor markets, and models of urban and regional growth and decline. Focus on application of economic theory and urban planning techniques to issues of public service delivery, local economic development, and land use planning.

URBS 450 Problems in Urban Law (3) Recommended preparation: six credits in URBS courses. A survey of the urban legal environment and special legal problems of urban governments and public interest lawyers. Problems related to planning, zoning, eminent domain and land use controls, consumer protection in central cities, housing codes and multiple dwelling regulation, public accommodations and civil rights ordinances, defending the indigent, and welfare delivery systems.

URBS 480 Urban Theory and Simulation (3) Review of early theories of the city. Contemporary theories of the city as a physical and an institutional system. Urban theory as integration of information involving economic, political, and social dimensions of contemporary cities. Simulation and gaming as theory testing; urban simulation and gaming as theory building.

URBS 488 Selected Topics in Urban Studies (1-3) Prerequisite: permission of instructor. Topics of special interest to advanced urban studies students. Repeatable to a maximum of six credits provided subject matter is different.

URBS 498 Honors Seminar in Selected Topics (3) Prerequisite: Admission to honors program in URBS or other departments. Individual reading and research, and group discussion dealing with selected major contemporary urban issues. Philosophy and growth of new towns, emergent forms of urban policy, federal legislation and the cities, citizen attitudes toward metropolitan government, housing abandonment, rehabilitation, and new construction, the urban future, major world capitals, and urbanization in developing nations. May be repeated to a maximum of six credits for credit provided the topics are different.

URBS 499 Honors Thesis (3-6) Prerequisite: admissions to honors program in URBS or other departments. Individual reading and research, and the writing of an original paper on an urban topic of the student's choice under the guidance of a faculty member.

WMST — Women's Studies

WMST 200 Introduction to Women's Studies (3) A historic and interdisciplinary study of the status, roles, and experiences of women. Sources from a variety of fields such as literature, psychology, history, and anthropology, focusing on the writings of women.

WMST 250 Women, Art and Culture (3) An exploration of women's creativity. Topics include traditional and alternative women's cultures, art, myth, literature, and theology by women, women's heroic journeys, and emerging feminist art and culture.

WMST 298 Selected Topics in Womens Studies (1-3) Repeatable to a maximum of 6 credits.

WMST 400 Theories of Feminism (3) A study of feminist theories from an interdisciplinary perspective, including politics, sociology, psychology, anthropology, and and philosophy. Prerequisite: a course on women (ideally WMST 200) or consent of the instructor.

WMST 498 Special Topics in Women's Studies (1-3) Repeatable to a maximum of 6 credits. Prerequisite: a course on women (ideally WMST 200) or consent of instructor.

ZOOL — Zoology

ZOOL 101 General Zoology (4) Three hours of lecture and two hours of laboratory per week. An introduction to the modern concepts of biological principles and animal life. Emphasis on the functional aspects of living systems with a survey of the physical and chemical bases of all life processes. Intended for non-majors with no zoology background who need a life sciences course or for potential zoology majors with no high school biology training.

ZOOL 181 Life in the Oceans (3) Thre lectures per week. Prerequisite: an introductory course in biological principles. Consideration of major groups of animals and plants in various marine environments and man's potential uses and misuses of the ocean. Not accepted for credit towards the zoology major.

ZOOL 201 Human Anatomy and Physiology I (4) Two hours of lecture and four hours of laboratory per week. Prerequisite: ZOOL 101 or equivalent. A thorough introduction to the anatomy and physiology of the skeletal, muscular, nervous and sensory systems. Introduction to cellular physiology. Not accepted for credit toward the zoology major.

ZOOL 202 Human Anatomy and Physiology II (4) Two hours of lecture and four hours of laboratory per week. Prerequisites: ZOOL 101 or equivalent. Introduction to the anatomy and physiology of the cardiovascular, respiratory, digestive, excretory and reproductive systems. Intermediary metabolism and endocrine relationships. Not accepted for credit toward the zoology major.

ZOOL 210 Animal Diversity (4) Two one-hour lectures and two two-hour laboratories per week. A comparative study of the diversity of animal form and function, including analysis of structures and mechanisms which different organisms utilize to cope with similar requirements of life. Not open for credit to students who have credit in ZOOL 293.

ZOOL 211 Cell Biology and Physiology (4) Three lectures and one three-hour laboratory per week. Prerequisite: CHEM 103. Biochemical and physiological mechanisms underlying cellular function. Properties of cells which make life possible and mechanisms by which cells provide energy, reproduce, and regulate and integrate with each other and their environment.

ZOOL 212 Ecology, Evolution and Behavior (4) Three lectures and one three-hour laboratory per week. Fundamental principles underlying the diversity of ecological, evolutionary, and behavioral relationships observed in nature, including the mechanisms of natural selection leading to adaptation of organisms to the environment. Not open for credit to students who have credit in ZOOL 270 OR 271.

ZOOL 213 Genetics and Development (4) Three lectures and one three-hour laboratory per week. Prerequisites: one semester of organic chemistry. An integration of the basic principles of two related subjects, genetics and development. Composition, transmission, and function of genetic material, basic processes of animal development, and the role of differential gene expression in control and regulation of development. Not open for credit to students who have credit in ZOOL 230 or 246.

ZOOL 299 Supplemental Study in Zoology (1-3) Prerequisite: consent of department. Research or special study to complement a course taken previously which is not fully equivalent to current departmental requirements. Credit according to work done. Repeatable to a maximum of six credits.

ZOOL 301 Biological Issues and Scientific Evidence (3) Prerequisite: an introductory college level biology course. The process of scientific inquiry in biology, using as models two areas in which scientific data of social importance is subject to widely differing interpretations. (1) evolution vs. creationism. (2) measurement of human intelligence. The provisional nature of scientific truth. Evolution and creation-science viewpoints. Intelligence testing is viewed from a historical perspective of its origins in 19th century craniometry and the subsequent development of intelligence tests.

ZOOL 308 Honors Seminar (1) One hour of discussion per week. Prerequisite: participation in honors program. Guided discussion of topics of current interest. Repeatable to total of four hours credit.

ZOOL 309 Honors Independent Study (1-4) Prerequisite: participation in the honors program. Study of classical material by way of guided independent study and laboratory experiments. Repeatable to a total of 12 hours credit.

ZOOL 318 Honors Research (1-2) Prerequisite: participation in the honors program. A laboratory research problem; required each semester during honors participation and culminating in a honors thesis. Repeatable to a total of eight hours credit.

ZOOL 319 Special Problems in Zoology (1-2) Prerequisites: a major in zoology or biological sciences, a minimum of 3.0 GPA in the biological sciences and consent of the instructor. Research or integrated reading in zoology. A student may register several times and receive up to 8 semester hours of credit.

ZOOL 328 Selected Topics in Zoology (1-4) Lectures, seminars, mini-courses and other special instruction in various zoological subjects. The contents and format of the course change frequently and students may register for it more than once up to a total of six credits.

ZOOL 330 Biological Aspects of Aging (3) Prerequisite: a college level course in biology or zoology. A survey of the biological changes occurring in cells, tissues and organs of aging vertebrates. Experimental evidence and current theories of the underlying mechanisms of aging, including both genetic and environmental effects. Not acceptable as credit toward the major in zoology.

ZOOL 346 Human Genetics and Society (3) Prerequisites: two college courses in the natural sciences and/or mathematics. For non-biological science students seeking an understanding of genetics, especially as it relates to humans and the decisions they may have to make as individuals and members of society. Study of genes, their mutation and transmittal, and the effect of recent discoveries on present and future generations. Not accepted for credit towards the zoology major.

ZOOL 361 Invertebrate Behavior (3) Two lectures and three hours of laboratory per week. Prerequisite: a college level course in zoology or a related discipline. An introduction to invertebrate behavior with emphasis on the observation, description and quantification of normal behavior in a variety of animals. This course does not fulfill the requirement of upper division laboratory courses for zoology majors.

ZOOL 381 Natural History of the Chesapeake Bay (3) Three lectures per week and at least one Saturday field trip. Prerequisites: a course in biological sciences or permission of instructor. Consideration of the major groups of organisms associated with the Chesapeake Bay and current issues that determine man's present and future uses for the Chesapeake and its biota. Not accepted as credit for the zoology major.

ZOOL 390 Comparative Vertebrate Morphology (4) Two hours of lecture and six hours of laboratory per week. Prerequisite: ZOOL 210 or ZOOL 212 or the equivalent. A comparative study of adaptive modifications in vertebrate structure and function as a result of natural selection.

ZOOL 411 Cell Biology (4) Three hours of lecture and four hours of laboratory per week. Prerequisites: ZOOL 211 and 213, CHEM 243 or 245, MATH 140 or 220, or permission of the instructor. A study of the molecular and biochemical basis of cell structure and of integrated functions of the subcellar organelles, with an emphasis on eukaryotes.

ZOOL 413 Biophysics (3) Three lectures a week. Prerequisites: ZOOL 211, PHYS 122 or 142, and MATH 140 or 220. An introduction to the ideas and methods used in biophysics to analyze the functional components of cells and tissues as physical-chemical systems.

ZOOL 415 Cell Differentiation (3) Prerequisite: ZOOL 211 or 213. The processes by which cells become differentiated from each other during development, with an emphasis on the biochemical and ultrastructural mechanisms of these changes.

ZOOL 421 Neurophysiology (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: an introductory course in zoology or biology (e.g., ZOOL 211), CHEM 233, and physics through an introduction to electricity and magnetism. The physiology of nerves, muscles and sensory receptors and aspects of central nervous system physiology.

ZOOL 422 Vertebrate Physiology (4) Three hours of lecture and three hours of laboratory per week. Prerequisites: ZOOL 211 and one semester of organic chemistry or permission of instructor. A study of the cardiovascular, hemopoietic, gastrointestinal, renal and respiratory systems. Chemical and endocrine regulation of physiological functions in higher vertebrates with emphasis on mammals.

ZOOL 426 General Endocrinology (3) Three hours of lecture per week. Prerequisites: ZOOL 211, CHEM 233, and CHEM 243. Functions and the functioning of the endocrine glands of animals with special reference to the vertebrates.

ZOOL 430 Vertebrate Embryology (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: ZOOL 211 and 213, or permission of instructor. Vertebrate embryogenesis, developmental physiology and experimental embryology.

ZOOL 431 Advanced Developmental Biology (3) Prerequisites: ZOOL 211, 213, and an upper division course in cell biology or developmental biology. A study of the progression of selected problems in developmental biology from their origins in classical experimental embryology to their current status in modern developmental biology, through analysis of original articles and experimental results.

ZOOL 440 Evolution (3) Prerequisites: ZOOL 210, ZOOL 212, and ZOOL 213. A consideration of current thought in regard to the evolution of living organisms.

ZOOL 444 Advanced Evolutionary Biology (3) Three hours of lecture per week. Prerequisites: ZOOL 440 or equivalent, one semester of calculus. The nature and consequences of organic evolution in relation to present day geography and geologic time. Topics covered will include organic diversity gradients in space and time, rates of evolution, co-evolution and extinctions. Particular emphasis will be placed in the synthesis of information and on construction and evaluation of hypotheses.

ZOOL 445 Genetic Analysis (3) Prerequisites: a course in genetics (e.g., ZOOL 213) and CHEM 233. A consideration of the mechanisms involved in the transmission of hereditary factors in eukaryotes. Emphasis on the experimental evidence and its interpretation which underlies our present knowledge of heredity.

ZOOL 446 Molecular Genetics (3) Prerequisites: A course in genetics (e.g., ZOOL 213) and a course in organic chemistry. The molecular basis of gene structure and function. Regulation of differential gene expression.

ZOOL 447 Experimental Genetics (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: two courses in genetics, one of which included laboratory work (e.g., ZOOL 213), and permission of instructor. A methodology and techniques course considering experimental design, the use of diverse organisms and instrumentation and the presentation and interpretation of data.

ZOOL 455 General Immunology (3) Prerequisites: ZOOL 211 and 213. Basic principles of immunobiology,

immunochemistry and immunogenetics with emphasis on the cellular and molecular basis of the immune response: cells of the immune system and their development, interactions and physiologic environment, the antibody response and interaction with antigen, cell mediated immunity, genetic regulation of the immune response; and the relationship of the immune system to disease. Credit not given for both ZOOL 455 and MICB 450.

ZOOL 456 Laboratory in General Immunology (1) Three hours of laboratory per week. Pre- or corequisite: ZOOL 455. Methodology and experimentation employed in basic and applied immunological research: detection, isolation and purification of antibodies, hybridoma production by cell fusion; maintenance of cell lines; purification of lymphoid cell populations, detection of cell mediated immunity, and mathematical analysis of immunological data.

ZOOL 460 Ethology (3) Prerequisites: ZOOL 210 and ZOOL 212. A course in physiology is recommended. An introduction to the principles of animal behavior with emphasis on physiological bases, ecological correlates and evolutionary aspects of behavior.

ZOOL 461 Ethology Laboratory (3) One hour of lecture and six hours of laboratory per week. Prerequisite or corequisite: ZOOL 460 or equivalent. Training in the description of behavior, methods of quantification and experimentation, and the mathematical treatment of behavioral data.

ZOOL 465 Behavioral Ecology (4) Prerequisites: ZOOL 212 or permission of instructor. Three lectures and one two-hour discussion-laboratory per week. The ways in which natural and social environments shape individual behavior. The influence of evolution on patterns of individual adaptation. Use of the evolutionary paradigm to investigate specific problems in animal and human behavior.

ZOOL 470 Advanced Animal Ecology (2) Prerequisites: ZOOL 212, a course in calculus, and a course in statistics. A course in genetics is strongly recommended. Theory of population growth and regulation, life tables and population projection theory of competition and predation, diversity analysis and island geography. Emphasis on current literature and research in ecological theory.

ZOOL 471 Laboratory and Field Ecology (2) Four hours of laboratory and field work per week. Co- or prerequisite: ZOOL 470. Laboratory and field exercises involving problems of contemporary ecological interest, population density regulation, community structure, and spatial pattern diversity in both terrestrial and aquatic systems. Topics coordinated with those presented in ZOOL 470.

ZOOL 472 Protozoology (4) Two hours of lecture and six hours of laboratory including field trips per week. Prerequisite: one year of biology. Basic conceptual treatment of free-living and parasitic protozoan functional morphology, life history, and systematics. The laboratory will stress observations of protozoa, living and stained, collected from diverse habits.

ZOOL 473 Marine Ecology (3) Prerequisites: A course in invertebrate zoology or animal diversity, and ZOOL 470, or permission of the instructor. Courses in evolution and animal behavior are strongly recommended. A detailed analysis of the evolutionary ecology of marine invertebrates, emphasis on testing of theories and on current literature.

ZOOL 475 General Parasitology (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: ZOOL 210, 212 and one semester of organic chemistry. A consideration of the phenomenon of parasitism through a study of the structure, function and host relationships of parasitic organisms.

ZOOL 477 Symbiology (3) Prerequisite: ZOOL 210. An introduction to basic concepts of symbiosis. Adaptations for establishment of symbiotic associations, symbiote nutrition and metabolism, responses of the host and ecology of the host-symbiote complex.

ZOOL 480 Aquatic Biology (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: a course in animal diversity (e.g., ZOOL 210) and a course in ecology (e.g., ZOOL 212). An investigation of the relationships of freshwater and estuarine biotic communities to their environment.

ZOOL 481 The Biology of Marine and Estuarine Invertebrates (4) Two hours of lecture and six hours of laboratory per week. Prerequisite: one year of zoology including ZOOL 210 or equivalent. A study of the taxonomy and functional morphology of the invertebrates, exclusive of insects. Emphasis on the study of living material.

ZOOL 482 Marine Vertebrate Zoology (4) Two hours of lecture and six hours of laboratory per week. Prerequisite: two years of zoology including ZOOL 210 and ZOOL 213. A consideration of the evolution, taxonomy, morphology, physiology, behavior and ecology of marine and estuarine protochordates and vertebrates.

ZOOL 483 Vertebrate Zoology (4) Two hours of lecture and four hours of laboratory per week. Prerequisite: ZOOL 212 or permission of instructor. The identification classification, habits, and behavior of vertebrates with emphasis on fresh water terrestrial and aerial forms, and a consideration of the evolution of living and fossil representatives.

ZOOL 492 Form and Pattern in Organisms (3) Prerequisites: one year of calculus, one year of physics; one semester of introductory biology. A lecture course in structural and functional interpretation of form in organisms. Pattern formation in morphogenesis, mathematical description of shape, methods, and examples of functional analysis of form, and patterns of morphological diversity through space and time.

ZOOL 495 Mammalian Histology (4) Two hours of lecture and six hours of laboratory per week. Prerequisites: ZOOL 211 AND 422, or permission of the instructor. A study of the microscopic anatomy, ultrastructure and histophysiology of tissues and organs of mammals.

6 Faculty Listing

Aaron, Henry J. Professor, Part-time, Economics B.A., University of California (Los Angeles), 1958, M.A., Harvard University, 1960, Ph.D., 1963

Abed, Eyad H. Assistant Professor Electrical Engineering B.S. Massachusetts Institute of Technology 1979, M.S., University of California (Berkeley), 1981, Ph.D., 1982.

Adams, Jeffrey D. Assistant Professor, Mathematics B.A., Johns Hopkins University, 1977, Ph.D., Yale University, 1981.

Adams, John Q., III Professor, Economics A.B., Oberlin College, 1960, Ph.D., University of Texas, 1965.

Adams, William W. Professor Mathematics B.A., University of California (Los Angeles), 1959, Ph.D., Columbia University, 1964

Ades, Ibrahim Z. Assistant Professor, Zoology B/A/, University of California (Los Angeles), 1971, Ph.D., 1976.

Adger, Carolyn T. Research Associate, Special Education. B.A. Ball State University 1961 M.A., University of Maryland, 1975, M.S., Georgetown University, 1978, Ph.D., 1984.

Adler, Isidore Professor, Chemistry and Biochemistry and Geology B.S., Brooklyn College, 1942, M.S., Brooklyn Polytechnic Institute, 1947, Ph.D., 1952.

Agar, Michael H. Professor, Anthropology A.B., Stanford University, 1967, Ph.D., University of California (Berkeley), 1971.

Aggour, M. Sherif Associate Professor, Civil Engineering B.S. Cairo University, 1964, M.S., 1966, Ph.D., University of Washington, 1972.

Agrawala, Ashok K. Professor, Computer Science B.S., Agra University, 1960 B.E., Indian Institute of Science, 1963; M.E., 1965, Ph.D., Harvard University, 1970.

Agre, Gene P. Associate Professor, Education Policy, Planning and Administration B.A. Macalester College, 1951; B.S., University of Minnesota 1953, M.A., 1956, Ph.D., University of Illinois (Urbana), 1964

Aguilar-Mora, Jorge Assistant Professor, Spanish and Portuguese B.A. Universidad Nacional de Mexico, 1974, Ph.D., El Colegio de Mexico, 1976.

Ahad, Rafiul Assistant Professor, College of Business and Management. B.Sc., Burma Arts and Science University, 1973, M.Sc., 1975, M.Sc., Asian Institute of Technology, 1980; Ph.D., University of Southern California, 1985.

A'Hearn, Michael F. Professor, Physics and Astronomy; Acting Director, Astronomy Program. B.S., Boston College, 1961, Ph.D., University of Wisconsin, 1966.

Ahrens, Richard A. Professor Food, Nutrition and Institution Administration B.S., University of Wisconsin, 1958, Ph.D., University of California (Davis), 1963.

Aiello, Elaine L. Instructor, Part-time, Special Education. B.S., Gallaudet College, 1966, M.A., Western Maryland, 1975.

Albrecht, Pedro Professor, Civil Engineering. Dipl. Ing., Federal Institute of Technology (Switzerland), 1962, Ph.D., Lehigh University, 1972.

Alexander, Charles, Jr. Lecturer, Part-time, Electrical Engineering B.S., Lowell Technological Institute, 1962, M.S., University of New Hampshire, 1965, Ph.D., University of Maryland, 1973.

Alexander, James C. Professor, Mathematics. B.A., Johns Hopkins University, 1964, Ph.D., 1968

Alexander, Millard H. Professor, Chemistry and Biochemistry. B.A., Harvard, 1964, Ph.D., University of Paris, 1967.

Alford, C. Fred Assistant Professor, Government and Politics. B.A., Austin College, 1969, M.A., University of Texas, 1971.

Aliminosa, Donna R. Instructor, Hearing and Speech Sciences B.A., Goucher College, 1973, M.A., The Catholic University of America, 1975.

Allen, J. David Associate Professor Zoology B.Sc., University of British Columbia, 1966, M.S., University of Michigan, 1968, Ph.D., 1971

Allen, Thomas K. Associate Professor, Counseling and Personnel Services B.S., Northwestern University, 1950, M.A., University of Maryland, 1964, Ph.D., 1966

Allen, Ira R. Lecturer Part-time, College of Journalism. B.S., University of Maryland, 1970.

Allen, LaRue Assistant Professor, Psychology A.B., Radcliffe College, 1972, M.S., Yale University, 1973, Ph.D., Yale University, 1980.

Allen, Redfield W. Professor, Part-time, Mechanical Engineering B.S., University of Maryland, 1943, M.S., 1949, Ph.D., University of Minnesota, 1959.

Allen, Roger J. Associate Professor, Health Education. B.S.E., University of Kansas, 1976, M.S., 1977; Ph.D., University of Maryland, 1979

Alley, Carroll O., Jr. Professor, Physics and Astronomy. B.S., University of Richmond, 1948, M.A., Princeton University, 1951, Ph.D., 1962.

Almenas, Kazys K. Associate Professor, Chemical and Nuclear Engineering B.S., University of Nebraska, 1957, Ph.D., University and Polytechnic of Warsaw, 1968.

Almon, Clopper, Jr. Professor, Economics. A.B., Vanderbilt University, 1956, Ph.D., Harvard University, 1962.

Alston-Mills, Brenda Assistant Professor, Animal Sciences. A.B., Lycoming College, 1967; M.Sc., Michigan State University, 1972, Ph.D., , 1984

Alt, Frank B. Associate Professor and Director of Doctoral Program, College of Business and Management. B.S.E., Johns Hopkins University, 1967; M.S., Georgia Institute of Technology, 1973, Ph.D., 1977.

Alter, Mary K. Instructor, Mathematics. B.S., University of Maryland, 1957.

Altman, Barbara Lecturer, Sociology B.A., Pennsylvania State University, 1958, M.A., University of Maryland, 1976, Ph.D., 1984

Amatucci, Joyce Instructor, Part-time, Spanish. B.A., University of Maryland, 1970.

Amershek, Kathleen G. Associate Professor, Curriculum and Instruction B.S., Indiana State College (Pennsylvania), 1951; M.Ed., Pennsylvania State University, 1957, Ph.D., University of Minnesota, 1966.

Amir, Amihood Assistant Professor, Computer Science, B.S., Bar Ilan University, Magna Cum Laude, 1975, M.S., Bar Ilan University, 1976, Ph.D., 1983.

Ammon, Herman L. Professor, Chemistry and Biochemistry B.Sc., Brown University, 1958, Ph.D., University of Washington, 1963.

Amodeo, Stefania Instructor, Part-time, French and Italian. Laurea in Literature, Genoa University (Italy), 1964.

Amoia, Carol M. Instructor, Special Education. B.S., University of Maryland, 1968, M.S., , 1976.

Anand, Davinder K. Professor, Mechanical Engineering, B.S., George Washington University, 1959, M.S., 1961; Ph.D., 1965.

Anastos, George Professor Emeritus, Zoology B.S., University of Akron, 1942, M.A., Harvard University, 1947; Ph.D., 1949.

Anderson, Amel Assistant Provost, Division of Agricultural and Life Sciences B.S., Jackson State University, 1962, M.S., University of Houston, 1969, Ed.D., Virginia Polytechnic Institute and State Univ., 1976.

Anderson, Clarita Instructor, Part-time, Textiles and Consumer Economics. B.S., University of Minnesota, 1959, Ph.D., University of Maryland, 1985.

Anderson, C. Raymond Associate Professor, Industrial, Technological and Occupational Education, Assistant Dean, College of Education B.S., University of Maryland, 1954, M.Ed., 1959, Ed.D., 1969

Anderson, Elaine A. Assistant Professor, Family and Community Development B.S. The University of Nebraska, 1973, M.S., The Pennsylvania State University, 1975, Ph.D., 1978

Anderson, John D. Jr. Professor, Aerospace Engineering B.S., University of Florida, 1959, Ph.D., Ohio State University, 1966.

Anderson, J. Robert Professor, Physics and Astronomy B.S., Iowa State University, 1955, Ph.D., 1963.

Anderson, Nancy S. Professor, Psychology B.A., University of Colorado, 1952, M.A., Ohio State University, 1953, Ph.D., 1956.

Anderson, Vernon E. Professor Emeritus, Administration, Supervision and Curriculum B.S., University of Minnesota, 1930, M.A., 1936, Ph.D., University of Colorado, 1942

Andreadis, Tim D. Assistant Professor, Chemical and Nuclear Engineering B.S., University of Maryland, 1974, M.S., 1977, Ph.D., 1981.

Andrews, J. Edward Visiting Professor, Education Policy, Planning and Administration B.S., Frostburg State College, 1957, M.Ed., University of Maryland, 1961, Ed.D., 1968

Andrews, Lyndal D. Research Assistant, Part-time, Special Education B.A., William & Mary, 1971, Master Music, New England Conservatory, 1978.

Angle, Jay S. Assistant Professor, Agronomy B.S., University of Maryland, 1975, M.S., , 1978, Ph.D., University of Missouri, 1980.

Anjanappa, Muniswamappa Research Graduate Assistant, Mechanical Engineering B.E., University of Bangalore (India), 1973, M.E., University of Madras (India), 1975.

Ankem, Sreeramamurthy Assistant Professor, Chemical and Nuclear Engineering M.E., Indian Institute of Science, 1974; Ph.D., Polytechnic Institute of New York, 1980.

Annand, Vicki Lecturer, Recreation B.S., Pennsylvania State University, 1969, M.Ed., George Washington University, 1973.

Ansell, Joseph P. Assistant Professor, Housing and Design. B.A., Knox College, 1971; M.F.A., George Washington University, 1975.

Ansello, Edward F. Affiliate Associate Professor, Family and Community Development, Associate Director, Center on Aging A.B. Boston College, 1966, M.Ed., University of Missouri, 1967, Ph.D., 1970.

Anspacher, William B. Lecturer, Part-time, Electrical Engineering B.S., Washington University, 1936, M.S., University of Maryland, 1950.

Antman, Stuart S. Professor, Mathematics B.S. Rensselaer Polytechnic Institute, 1961; M.S., University of Minnesota, 1963, Ph.D., 1965.

Antonsen, Thomas M. Associate Professor, Physics and Astronomy, , Electrical Engineering. B.S., Cornell University, 1973, M.S., , 1976, Ph.D., 1977.

Arends, Richard I. Professor and Chairperson, Curriculum and Instruction B.S., Eastern Oregon College, 1959, M.A., University of Iowa, 1961, Ph.D., University of Oregon, 1972.

Armstrong, Earlene Associate Professor, Entomology B.S., North Carolina Central University, 1969, M.S., 1970, Ph.D., Cornell University, 1975.

Armstrong, Richard N. Assistant Professor, Chemistry and Biochemistry B.S., Western Illinois University, 1970, Ph.D., Marquette University, 1974.

Armstrong, Ronald W. Professor, Mechanical Engineering, B.E.S., Johns Hopkins University, 1955; M.Sc., Carnegie-Mellon University, 1957; Ph.D., Carnegie-Mellon University, 1958.

Arnold, Douglas Associate Professor, Mathematics A.B., Brown University, 1975, S.M., University of Chicago, 1976, Ph.D., 1979

Arrighi, Margarite A. Assistant Professor, Physical Education B.S., Westhampton College, 1958, M.S., University of Maryland, 1962, Ph.D., University of North Carolina (Greensboro), 1974

Arsenault, Richard J. Professor, Chemical and Nuclear Engineering, Director, Engineering Materials Program B.S., Michigan Technology University, 1957, Ph.D., Northwestern University, 1962

Ashley, Roy D. Instructor, Industrial, Technological and Occupational Education B.S., College of William and Mary, 1960 M.S., University of Southern California, 1980, M.S., Central Michigan University, 1981.

Ashton, Robert B. Lecturer, Part-time, Communication Arts and Threate B.S., Syracuse University, 1968, M.S., 1975.

Assad, Arjang J. Associate Professor, College of Business and Management, B.S., Massachusetts Institute of Technology, 1971, M.S., 1976, Ph.D., 1978

Atchison, William F. Professor, Computer Science A.B., Georgetown College (Kentucky), 1938 M.A., University of Kentucky, 1940, Ph.D., University of Illinois (Urbana), 1943.

Athey, Whitfield T. Lecturer, Part-time, Electrical Engineering B.S., Auburn University, 1964, M.S., 1966; Ph.D., Tufts University, 1975.

Atlas, Robert Visiting Lecturer, part-time, Meteorology B.S., Parks College of St. Louis, 1970, M.S., New York University, 1973, Ph.D., 1976.

Auchard, John F. Assistant Professor, English A.B., New York University, 1970, M.A., University of Michigan, 1971; Ph.D., University of North Carolina, 1980.

Auerbach, Jonathan Assistant Professor, English. B.A., University of California (Santa Cruz), 1976, M.A., Johns Hopkins University, 1978, Ph.D., , 1984.

Augustine, Patricia C. Adjunct Assistant Professor, Poultry Science B.S., University of Maryland, 1955, M.S., , 1976, Ph.D., 1980.

Aumiller, Lyndol Instructor, Industrial, Technological and Occupational Education B.A., California State University, 1970, B.A., University of Northern Colorado, 1976, M.A., San Diego State University, 1978.

Aung, Win Adjunct Professor, Mechanical Engineering B.S., Ragoon University (Burma), 1962; M.S., University of Minnesota, 1966, Ph.D., , 1969.

Auslander, Joseph Professor, Mathematics B.S., Massachusetts Institute of Technology, 1952, M.S., University of Pennsylvania, 1953, Ph.D., 1957.

Austing, Richard H. Associate Professor, Computer Science. B.S., Xavier University, 1953, M.S., Saint Louis University, 1955, Ph.D., Catholic University of America, 1963.

Axelson, Marta L. Associate Professor, Food, Nutrition and Institution Administration B.S., Florida State University, 1975, Ph.D., University of Tennessee, 1979.

Aycock, Marvin K., Jr. Professor and Acting Chairman, Agronomy B.S., North Carolina State University, 1959, M.S., 1963, Ph.D., Iowa State University, 1966.

Aylward, Thomas J. Professor, Communications Arts and Theatre B.S., University of Wisconsin, 1947, M.S., 1949, Ph.D., 1960.

Ayyub, Bilel Assistant Professor, Civil Engineering B.S., Kuwait University, 1980, M.S., Georgia Institute of Technology, 1981, Ph.D., 1983.

Azar, Edward E. Professor, Government and Politics; Director, Center for International Development and Conflict Management B.A., American University of Beirut, 1960, M.A., University of the Pacific, 1965, Ph.D., Stanford University, 1969.

Azarm, Shapour Assistant Professor, Mechanical Engineering B.S., University of Tehran (Iran), 1977, M.S., George Washington University, 1979, Ph.D., University of Michigan, 1984

Aziz, A. Kadir Adjunct Professor, Institute for Physical Science and Technology and Mathematics B.S., Wilson Teachers College, 1952, M.S., George Washington University, 1954, Ph.D., University of Maryland, 1958

Babuska, Ivo Research Professor, Mathematics and Institute for Physical Science and Technology Dipl. Ing., Technical University of Prague 1949 Ph.D., 1951 Ph.D., Czechoslovak Academy of Sciences, 1955, D.Sc., 1960

Baer, Ferdinand Professor and Chairmen, Meteorology B.A., University of Chicago, 1950, M.S., 1954, Ph.D., 1961.

Bailey, Elaine L. Instructor, Institute of Applied Agriculture B.S., Clemson University, 1982, M.S., Iowa State University, 1984

Bailey, William J. Research Professor, Chemistry and Biochemistry B.Chem. University of Minnesota, 1943, Ph.D., University of Illinois, 1946

Baker, David W. Lecturer, Part-time, Mechanical Engineering B.S., University of Maryland, 1943, M.S., 1951, Ph.D., 1967

Baker, Donald J. Associate Professor, Hearing and Speech Sciences B.S., Ohio State University, 1954, M.A., 1956, Ph.D., 1962

Baker, Edward W. Adjunct Professor, Entomology B.S., University of California, (Berkeley), 1936, Ph.D., 1938

Baker, George T., III Director, Center on Aging B.A., University of Connecticut, 1966, B.S., 1966 M.S., University of Rhode Island, 1969, Ph.D., University of Miami, 1971.

Ball, Michael O. Associate Professor, College of Business and Management B.E.S., Johns Hopkins University, 1972, M.S.E., 1972, Ph.D., Cornell University, 1977.

Ballmann, H. Warner Associate Professor, Mathematics. Diplom., University of Bonn, 1976, Dr. Rer. Nat., 1979, Dr. Rer. Nat. Hab., University of Bonn., 1984

Balthrop, Carmen A. Assistant Professor, Music. B.M., University of Maryland, 1971, M.M., Catholic University, 1972.

Bandel, Vernon A. Professor, Agronomy. B.S., University of Maryland, 1959, M.S., 1962, Ph.D., 1965.

Banerjee, Manoj K. Professor, Physics and Astronomy B.S., Patna University, 1949, M.S., Calcutta University, 1952, Ph.D., 1956.

Barao, Scott M. Assistant Professor, Animal Sciences B.S., Michigan State University, 1980, M.S., 1983; Ph.D., 1985.

Bares, John S. Professor, Electrical Engineering Dipl.E.E., National Technical University of Athens, 1970, S.M., Harvard University, 1971, Ph.D., 1973.

Barbe, David F. Associate Director for Energy Research Center; Professor, Electrical Engineering B.S., West Virginia University, 1962; M.S., , 1964, Ph.D., Johns Hopkins University, 1969

Barbera, Anthony J. Assistant Professor, College of Business and Management B.S., Loyola College, 1970; M.S., University of Maryland, 1977, Ph.D., 1982.

Barbosa, Pedro Professor, Entomology B.S., City College of New York, 1966, M.S., University of Massachusetts, 1969; Ph.D., 1971.

Bardasis, Angelo Associate Professor and Associate Chairman, Physics and Astronomy B.A., Cornell University, 1957; M.S., University of Illinois (Urbana), 1959, Ph.D., , 1962

Barilla, Anthony E. Instructor, Part-time, Spanish. B.A., University of Maryland, 1969, M.A., 1971, Ph.D., 1982.

Barker, Donald B. Associate Professor, Mechanical Engineering B.S.M.E., University of Washington, 1969, M.S., 1971, Ph.D., University of California (Los Angeles), 1976.

Barkin, Steve M. Associate Professor, College of Journalism, B.A., Pennsylvania State University, 1965, M.A., , 1970, Ph.D., University of Illinois, 1977.

Barlow, Jewel B. Associate Professor, Aerospace Engineering B.Sc., Auburn University, 1963, M.S., 1964, Ph.D., University of Toronto, 1970

Barnett, Audrey J. Associate Professor, Zoology B.A., Wilson College, 1955; M.A., Indiana University, 1957, Ph.D., 1962.

Barnett, Neal M. Associate Professor, Botany B.S., Purdue University, 1959, Ph.D., Duke University, 1966

Barnett, Ronald J. Associate Professor, Music B.Mus., University of Rochester, 1960; M.Mus., University of Maryland, 1973.

Baron, Sandy D. Instructor Part-time, Institute of Applied Agriculture B.A., Michigan State University, 1974, J.D., Catholic University, Columbus School of Law, 1977

Barrabini, Micheline Instructor, French and Italian Licence en Droit, Bordeaux (France), 1952, Licence es Lettres, Aix-en Provence (France), 1955

Barry, Jackson G. Associate Professor English B.A. Yale University 1950 M.A. Columbia University, 1951, Ph.D., Case-Western Reserve University, 1963

Bartlett, Joan C. Instructor, Part-time, Human Development B.A. Dunbarton College of the Holy Cross, 1971, M.Ed., Howard University, 1975, Ph.D., 1984

Bartol, Kathryn M. Professor, College of Business and Management. B.A., Marygrove College, 1963, M.A., University of Michigan, 1966, Ph.D., Michigan State University, 1972

Basili, Victor R. Professor and Chairman, Computer Science. B.S., Fordham University, 1961, M.S., Syracuse University, 1963, Ph.D., University of Texas, 1970

Basu, Amit Lecturer, College of Business and Management. B.S., Indian Institute of Technology, 1979 M.B.A., Southern Illinois University, 1981, M.S., University of Rochester, 1983.

Bauer, Richard H. Professor Emeritus, History B.A., University of Chicago, 1924, M.A., 1928, Ph.D., 1935

Baum, Howell S. Affiliate Associate Professor, Urban Studies B.A., University of California (Berkeley), 1967, M.A., University of Pennsylvania 1968, M.C.P., University of California (Berkeley), 1971, Ph.D., 1974

Beach, Eugene H., Sr. Lecturer, Part-time, Physics and Astronomy B.S., University of Michigan, 1941, M.S., 1947, Ph.D., 1953

Beale, Robert S. Assistant to the Provost for Affirmative Action, Division of Agricultural and Life Sciences B.S., West Virginia State College, 1932, M.S., University of Pennsylvania, 1935, Ph.D., Pennsylvania State University, 1942.

Bean, George A. Professor, Botany B.S., Cornell University, 1958, M.S., University of Minnesota, 1960, Ph.D., 1963.

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